
 W P E R L H
 ***** (TM)

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MPSrch_pp prote: - protein database search, using Smith-Waterman algorithm
 On: Tue Aug 29 15:39:31 2000; MasPar time 13.05 seconds
 Tabular output no generated. 799.062 Million cell updates/sec

Title: >US-09-121-017B-1
 Description: (17221) from US09121017B.pep
 Perfect Score: 1593
 Sequence: 1 MAPARLALLFFVGVGVES.....PRHYGQKAILFLPLVSSD 221

Scoring table: PAM 150
 Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%
 Listing first 45 summaries

Database: p1r64

1:p1r1 2:p1r2 3:p1r3 4:p1r4

Statistics: Mean 45.223; Variance 83.789; scale 0.540

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Query	Score	Match	Length	DB ID	Description	Pred. No.
1	984	61.8	155	1	A33665	acidic fibroblast gro	2.18e-185
2	972	61.0	155	2	D37360	acidic fibroblast gro	1.06e-182
3	972	61.0	155	2	S04147	acidic fibroblast gro	1.06e-182
4	967	60.7	155	1	A60721	acidic fibroblast gro	1.40e-181
5	95	59.8	152	1	JH0476	acidic fibroblast gro	1.91e-178
6	92	57.9	155	1	GKBOA	acidic fibroblast gro	9.72e-172
7	92	57.9	155	2	A60130	acidic fibroblast gro	1.63e-171
8	92	57.3	151	2	JW0055	fibroblast growth fac	2.78e-169
9	61	38.2	19	2	JC1457	ryudocan precursor -	3.90e-102
10	5	32.8	1f	2	A48834	basic fibroblast grow	1.60e-83
11	5	32.4	1	1	S00185	basic fibroblast grow	3.12e-82
12	5	32.4	1	1	GKBOB	basic fibroblast grow	3.12e-82
13	5	32.0	1	0	A32398	basic fibroblast grow	9.93e-81
14	5	31.9	134	2	A31674	basic fibroblast grow	1.63e-80
15	5	31.9	154	2	C37360	basic fibroblast grow	1.63e-80
16	4	31.3	164	2	S31622	basic fibroblast grow	2.26e-78
17	4	30.7	155	1	A40117	basic fibroblast grow	1.90e-76
18	4	29.3	137	2	I46711	fibroblast growth fac	1.52e-71
19	394	24.7	202	2	A42410	ryudocan precursor -	2.30e-56
20	360	22.6	208	2	A48137	fibroblast growth fac	2.62e-49
21	360	22.6	208	2	S66486	fibroblast growth fac	2.62e-49
22	359	22.5	198	2	JC5613	ryudocan precursor -	4.22e-49
23	329	20.7	207	2	JC5941	fibroblast growth fac	5.96e-43

24 324 20 2 JC5940 fibroblast growth fac 6.21e-42
 25 303 19 2 S49501 keratinocyte growth f 1.09e-37
 26 300 18 8 A3301 fibroblast growth fac 4.38e-37
 27 296 16 6 A48610 keratinocyte growth f 2.78e-36
 28 294 15 5 A26049 fibroblast growth fac 6.98e-36
 29 288 14 1 S23595 embryonic fibroblast 1.10e-34
 30 275 13 3 S54407 embryonic fibroblast 4.20e-32
 31 276 12 3 A50710 fibroblast growth fac 2.66e-32
 32 274 11 2 A36207 transforming protein 6.62e-32
 33 274 10 2 S68144 fibroblast growth fac 6.62e-32
 34 269 9 1 TVHUF5 transforming protein 6.42e-31
 35 267 8 2 JC4627 fibroblast growth fac 1.59e-30
 36 265 7 6 A34268 fibroblast growth fac 3.93e-30
 37 263 6 2 JH0708 RST protein - bovine 9.69e-30
 38 257 5 2 JG0184 fibroblast growth fac 1.45e-28
 39 255 4 1 TVHUS fibroblast growth fac 3.55e-28
 40 247 3 2 S20102 fibroblast growth fac 8.14e-27
 41 245 2 2 I50588 FGF-3 - chicken 3.10e-26
 42 243 1 2 A32484 basic fibroblast grow 1.67e-24
 43 241 1 2 S14192 fibroblast growth fac 2.60e-24
 44 235 1 2 S39582 transforming protein 1.67e-24
 45 234 1 2 B46289 keratinocyte growth f 4.04e-24

ALIGNMENTS

RESULT 1
 ENTRY A33665 #type complete
 TITLE acidic fibroblast growth factor precursor - human
 ALTERNATE_NAMES beta-ECGF; endothelial cell growth factor beta;
 ORGANISM Homo sapiens
 #fc_mal_name Homo sapiens common_name man
 DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
 ACCESSIONS A33665; A32316; S18217; A43804; A24662; JH0707; S3535;
 S33536; I39413; A23553; A24820; A24243; A24301; A26386;
 A53539
 REFERENCE A33665
 #authors Merga, A.; Tischer, E.; Graves, J.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.
 #journal Blochem. Biophys. Res. Commun. (189) 164:1121-29
 #title Structural analysis of the gene for human acidic fibroblast growth factor.
 #cross-references MUID:90073637
 #accession A33665
 #molecule_type DNA
 #residues 1-155 #label MER
 #cross-references GB:M30491
 REFERENCE A32316
 #authors Wang, W.P.; Lehtonen, K.; Varbel, M.L.; Krishnan, I.; Chiu, I.M.
 #journal Mol. Cell. Biol. (1989) 9:2387-2395
 #title Cloning of the gene coding for human class heparin-binding growth factor and its expression in fetal tissues.
 #cross-references MUID:89343957
 #accession A32316
 #molecule_type DNA
 #residues 1-155 #label WAN
 #cross-references GB:M23087; NID:gl83875; PIDN:AAA638.1; PID:g386768
 REFERENCE S18217
 #authors Wang, W.P.; Quick, D.; Balcerzak, S.P.; Seedelman, S.W.; Chiu, I.M.
 #journal Oncogene (1991) 6:1521-1529
 #title Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients.
 #cross-references MUID:92019819
 #accession S18217
 #molecule_type DNA
 #residues 1-155 #label WA2
 #cross-references EMBL:M23086
 REFERENCE A43804

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#authors Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal Oncogene (1990) 5:755-762
#title Alternative splicing generates two forms of mRNA coding for
#       human heparin-binding growth factor 1.
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
#accession A24662
#molecule_type mRNA
#residues 1-155 ##label CHI
##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#authors Jaye, M.; Hawk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
#       Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
#       Drohan, W.N.
#journal Science (1986) 233:541-545
#title Human endothelial cell growth factor: cloning, nucleotide
#       sequence, and chromosome localization.
#cross-references MUID:86261805
#accession A24662
#molecule_type mRNA
#residues 1-155 ##label JAY
##cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#authors Yu, Y.L.; Kha, H.; Golden, J.A.; Migchelsen, A.A.J.; Goetzl,
#       E.J.; Turck, C.W.
#journal J. Exp. Med. (1992) 175:1073-1080
#title An acidic fibroblast growth factor protein generated by
#       alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession JH0707
#molecule_type mRNA
#residues 1-155 ##label YUI
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#authors Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
#       S.E.; Myers, R.L.; Chiu, I.M.
#journal Nucleic Acids Res. (1993) 21:489-495
#title Cloning of two novel forms of human acidic fibroblast growth
#       factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession S35535
#status translation not shown
#molecule_type mRNA
#residues 1-58 ##label PAY
##cross-references GB:L01485
#accession S35536
#status translation not shown
#molecule_type mRNA
#residues 1-58 ##label P2
##cross-references GB:L01487
REFERENCE
#authors Crumley, G.; Dionne, C.A.; Jaye, M.
#journal Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title The gene for human acidic fibroblast growth factor encodes
#       two upstream exons alternatively spliced to the first
#       coding exon.
#cross-references MUID:90365758
#accession I39413
#status translation not shown
#molecule_type mRNA
#residues 1-40 ##label REI
##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
#       GB:M60516; NID:g178232; PID:g553171
REFERENCE
#authors Harper, J.W.; Strydom, E.J.; Lobb, R.R.
#journal Biochemistry (1986) 25:4997-4103
#cross-references MUID:86296647
#accession A23553
#molecule_type protein
#residues 16-155 ##label HAR
REFERENCE
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title The complete amino acid sequence of human brain-derived
#       acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession A24820
#molecule_type protein
#residues 16-155 ##label GIM
REFERENCE
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth
#       factors: amino terminal sequences and specific mitogenic
#       activities.
#cross-references MUID:86186784
#accession A24243
#molecule_type protein
#residues 16-47 ##label GI2
##experimental_source brain
REFERENCE
#authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell
#       mitogens from human brain: acidic and basic fibroblast
#       growth factors.
#cross-references MUID:86275260
#accession A24301
#molecule_type protein
#residues 16-30, 'X', 32-49 ##label GAU
REFERENCE
#authors Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession A26386
#molecule_type protein
#residues 16-155 ##label GA2
##experimental_source brain
REFERENCE
#authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
#       Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
#       Midaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
#       factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
#molecule_type protein
#residues 16-30, 'X', 32-38; 73-75, 'X', 77-97, 'X', 99-101; 128-131, 'X',
#       133-140, 'X', 142-152 ##label CHA
GENETICS
#gene GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor:
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
#product fibroblast growth factor 1 #status experimental
#label HAR\
#binding_site carbohydrate (Asn; covalent) #status
#length 155 #molecular_weight 17460 #checksum 9243
SUMMARY
Query Match 61.8%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 2.18e-185;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 21 GNYPKLLYCSNGGHFLRILPDGTVDRSDQHQIQLQLSAESVGEYIKSTFGQYL 80
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QY 87 ANYKPKLLYCSNGGHFLRILPDGTVDRSDQHQIQLQLSAESVGEYIKSTFGQYL 146.
Db 81 AMDTGLLYGSQTPNECLFLERLENNHYNTYISKHAEKNFVGLKKGSCCKGRPRTH 140
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QY 147 AMDTGLLYGSQTPNECLFLERLENNHYNTYISKHAEKNFVGLKKGSCCKGRPRTH 206

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TITLE	ORGANISM	acfidal_fibroblast growth factor - pig (fragment)
ORGANISM		#formal_name Sus scrofa domestica #common_name domestic pig
DATE		31-Mar-1992 #sequence revision 31-Mar-1992 #text change

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16-Jul-1999
JH0476; S20072
ACCESSIONS
REFERENCE
#authors
#journal
#title
#cross-references EMBL:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152
#label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION
KEYWORDS
FEATURE
22-28
133
SUMMARY
#region nuclear location signal\
#binding site heparin (Lys) #status predicted
#length 152 #checksum 1124
Query Match 59.8%; Score 953; DB 2; Length 152;
Best Local Similarity 97.0%; Pred. No. 1.91e-178;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
Db 21 GNYKKPLLYCSNGGHFLRIIPDGTDRSDQHIQLQLSAESVGEVIKSTETGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 87 ANYKKPLLYCSNGGHFLRIIPDGTDRSDQHIQLQLSAESVGEVIKSTETGQYL 146
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Db 81 AMDTSGLLYSQTPSEECFLERLEENHYNTYTKKHAENWVFLKNGSKCKRGPRTY 140
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Qy 147 AMDTGLLYGSQTPNEECFLERLEENHYNTYTKKHAENWVFLKNGSKCKRGPRTY 206
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Db 141 GOKAILFLPLPV 152
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Qy 207 GOKAILFLPLPV 218
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RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatin
ORGANISM #formal name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
ESSIONS
JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE
#authors Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE
S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
S02861
REFERENCE
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S03661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
S22065
REFERENCE
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PH
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
A94290
REFERENCE
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
A94281
REFERENCE
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; Disalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
S03953
REFERENCE
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
A91010
REFERENCE
#authors Bollen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
A24477
REFERENCE
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
A94127
REFERENCE
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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Sasaki., H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, T.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine
heart and its localization in the cardiac myocytes.
#cross-references MUID:'0008933
#accession A34477
##status preliminary
##molecule_type protein
##residues 16-24 121-127;134-143 #label SAS
##experimental_source heart
COMMENT The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT This protein binds heparin, although less strongly than does bFGF.
COMMENT There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the pig
...
Note: remainder of annotations omitted.
Query Match 57.9%; Score 923; DB 1; Length 155;
Best Local Similarity 90.4%; Pred. No. 9,72e-172;
Matches 126; Conservative 7; Mismatches 5; Indels 1; Gaps 1;

Db 18 LPL-GNYKKPKLLLYCSN::SYFLRLIPDGTVDGTRKDRSDQHILQLCASIGEVYIKSTET 76
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QY 83 VPLDANIYKKPKLLLYCSNGHFLRILPDGTVDTGRSDQHILQQLS'ESVGEVYIKSTET 142
|| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Db 77 GQFLAMDIDGLLYGSQ::PNEECFLERLEENHYNTYSKKHAKHW-/GLKNKRSLKLP 136
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QY 143 GQFLAMDIDGLLYGSQ::PNEECFLERLEENHYNTYSKKHAKNMVGLUKNGSKCRGP 202
|| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Db 137 RTHFGOKAILFLPLPVSSD 155
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QY 203 RTHYGOKAILFLPLPVSSD 221
|| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 7
ENTRY
TITLE acidic_fibroblast_growth_factor - chicken
ALTERNATE_NAMES endothelial_cell_growth_factor
ORGANISM fformal_name Gallus gallus #common_name: chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130; S02639
#authors Schuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##cross-references GB:S63263; NID:g234372; PID:AAB19629.1; PID:g234373
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
##molecule_type protein
##residues 22-30,'X',32-44,'X',46-48 #label RIS
CLASSIFICATION #superfamily_fibroblast_growth_factor
KEYWORDS growth_factor

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SUMMARY          #length 155 #molecular-weight 17322 #checksum 7617
Query Match      57.9%; Score 922; DB 2; Length 155;
Best Local Similarity 89.2%; Pred. No. 1.63e-171;
Matches 124; Conservative 7; Mismatches 7; Indels 1; Gaps 1;

Db 18 LPL-GNYKKPKLLYCSNGGHFLRILPDGKVDGTRDSQHIQLOLSAEDVGVEVIKSTAS 76
QY 83 VPLDANYKKPKLLYCSNGGHFLRILPDGTVDTGTRDSQHIQLOLSAESVGVEVIKSTET 142

Db 77 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFVGLKKNKNGSKLGP 136
QY 143 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFVGLKKNKNGSKRGP 202

Db 137 RTHYGOKAILFLPLPVSSD 155
QY 203 RTHYGOKAILFLPLPVSSD 221

RESULT 8
ENTRY   JW0055 #type complete
TITLE   fibroblast growth factor-1 - sheep
ALTERNATE_NAMES FGF-1
ORGANISM 17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
DATE    07-May-1999
ACCESSIONS JW0055
REFERENCE  Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
#authors   Donjerakovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
           Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
           W.H.
#journal   Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title     Primary structure of ovine fibroblast growth factor-1 deduced
           by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues 1-155 #label GRI
COMMENT   This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
           in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY       #length 155 #molecular-weight 17557 #checksum 8890

Query Match      57.3%; Score 912; DB 2; Length 155;
Best Local Similarity 89.2%; Pred. No. 2.78e-169;
Matches 124; Conservative 9; Mismatches 5; Indels 1; Gaps 1;

Db 18 LPL-GNYKKPKLLYCSNGGHFLRILPDGKVDGTRDSQHIQLOLSAESVGVEVIKSTET 76
QY 83 VPLDANYKKPKLLYCSNGGHFLRILPDGTVDTGTRDSQHIQLOLSAESVGVEVIKSTET 142

Db 77 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFVGLKKNKNGSKLGP 136
QY 143 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFVGLKKNKNGSKRGP 202

Db 137 RTHYGOKAILFLPLPVSSD 155
QY 203 RTHYGOKAILFLPLPVSSD 221

RESULT 9
ENTRY   JC1457 #type complete
TITLE   ryudocan precursor - human
ALTERNATE_NAMES amphiglycan; core protein
ORGANISM 30-Sep-1993 #sequence_revision 30-Sep-1993 #text_change
DATE    17-Mar-1999
ACCESSIONS JC1457; S26695
REFERENCE  Kojima, T.; Inazawa, J.; Takamatsu, J.; Rosenberg, R.D.;
#authors   Satio, H.
#journal   Biochem. Biophys. Res. Commun. (1993) 190:814-822
```

```
#title Human ryudocan core protein: Molecular cloning and
characterization of the cDNA, and chromosomal localization
of the gene.
#cross-references MUID:93176185
#accession JC1457
#molecule_type mRNA
#residues 1-198 #label KOJ
#cross-references DBJ:D13292; NID:g286020; PID:d1003053; PID:g286021
REFERENCE S26695
#authors David, G.; van der Schueren, B.; Marynen, P.; Cassiman, J.J.;
           van den Berghe, H.
#journal J. Cell Biol. (1992) 118:961-969
#title Molecular cloning of amphiglycan, a novel integral membrane
           heparan sulfate proteoglycan expressed by epithelial and
           fibroblastic cells.
#cross-references MUID:92363936
#accession S26695
#status preliminary
#molecule_type mRNA
#residues 1-11,13-198 #label DAV
#cross-references EMBL:X67016; NID:g28679; PID:g28680
GENETICS
#map_position 20q12
KEYWORDS chondroitin sulfate proteoglycan; core protein; glycoprotein;
           heparan sulfate; transmembrane protein
FEATURE
1-18 #domain signal sequence #status predicted #label SIG\
19-198 #product ryudocan #status predicted #label MAT\
146-170 #domain transmembrane #status predicted #label TMM\
39,61,63 #binding_site heparan sulfate (Ser) (covalent) #status
           predicted
SUMMARY #length 198 #molecular-weight 21641 #checksum 4522

Query Match      38.2%; Score 508; DB 2; Length 198;
Best Local Similarity 97.7%; Pred. No. 3.90e-102;
Matches 86; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARFALLFFVGGVAESIRETEVIDPDLLGGRVFGALPDDEDVVGQESDDFEL 60
QY 1 MAPARFALLFFVGGVAESIRETEVIDPDLLGGRVFGALPDDEDVVGQESDDFEL 60

Db 61 SGSGDLDLEDSDMGPEVHVPLVPLDNH 88
QY 61 SGSGDLDLEDSDMGPEVHVPLVPLDNH 88

RESULT 10
ENTRY   A48834 #type complete
TITLE   basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE     01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
           16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE  Borja, A.Z.; Meijers, C.; Zeller, R.
#authors   Dev. Biol. (1993) 157:110-118
#journal   Expression of alternatively spliced bFGF first coding exons
           and antisense mRNAs during chicken embryogenesis.
#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note      sequence extracted from NCBI backbone (NCBIN:131000,
           NCBIPI:131001)
REFERENCE S23636
#authors   Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal   Development (1990) 109:387-393
#title     Fibroblast growth factor during mesoderm induction in the
           early chick embryo.
#cross-references MUID:90382254
#accession S23636
```

##status	preliminary
##molecule_type	DNA
##residues	95-128 ##label MIT
##cross-references	EMBL:X56804; NID:G62855; PIDN:CAA40139.1; PID:G62856
CLASSIFICATION	#superfamily fibroblast growth factor
SUMMARY	#length 189 #molecular-weight 20312 #checksum 8538
Query Match	32.8%; Score 522; DB 2; Length 189;
Best Local Similarity	54.5%; Pred. No. 1.60e-83;
Matches	73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db	58 GHFKDPKRLYCKNGGFFLRHPDGRVDGVREKSDPHIKIQLQAEERGVVYSIKGVGSANREL 117
QY	87 ANYKKPLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQSAESVGEVIYIKSTETGQYL 146
Db	118 AKMEDGRLLALKCAATECECFERLENNNTYRSRKYSD--WYVALKRTGYKPGPKTGP 175
QY	147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGRPTHY 206
176	GQKAILFLPMSAKS 189
QY	207 GQKAILFLPVPSS 220
RESULT 11	
ENTRY	S00185 #type complete
TITLE	basic fibroblast growth factor - sheep
ALTERNATE_NAMES	prostatropin
ORGANISM	#formal_name Ovis orientalis aries, Ovis ammon aries
	#common_name domestic sheep
DATE	10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
ACCESSIONS	S00185
REFERENCE	S00185
#authors	.Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice, E.C.; Rubira, M.R.; Burgess, A.W.
#journal	FBS Lett. (1987) 224:128-132
#title	Primary structure of ovine pituitary basic fibroblast growth factor.
#cross-references	MUID:88055577
#accession	S00185
##molecule_type	protein
##residues	1-146 ##label SIM
CLASSIFICATION	#superfamily fibroblast growth factor
KEYWORDS	growth factor; heparin binding; mitogen
FEATURE	
18-22	#region heparin binding #status predicted\
107-110	#region heparin binding #status predicted
WMARY	#length 146 #molecular-weight 16434 #checksum 3560
Query Match	32.4%; Score 516; DB 1; Length 146;
Best Local Similarity	55.2%; Pred. No. 3.12e-82;
Matches	74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db	15 GHFKDPKRLYCKNGGFFLRHPDGRVDGVREKSDPHIKIQLQAEERGVVYSIKGVGSANRYL 74
QY	87 ANYKKPLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQSAESVGEVIYIKSTETGQYL 146
Db	75 AKMEDGRLLAKSCVTCECFERLENNNTYRSRKYSD--WYVALKRTGYKLPKPTGP 132
QY	147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGRPTHY 206
133	GQKAILFLPMSAKS 146
QY	207 GQKAILFLPVPSS 220
RESULT 12	
ENTRY	GKBOB #type fragment
TITLE	basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES	bref; kidney-derived growth factor; prostotropin
ORGANISM	#formal_name Bos primigenius taurus #common_name cattle
DATE	13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change

```

#title      Isolation of an amino terminal extended form of basic
#cross-references MUID:86295737
#contents   annotation
#note       the amino end of this form was blocked; the peptide
            composition matched what was thought to be the signal
            sequence
REFERENCE
#authors    Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
            Bohlen, P.
#journal    Endocrinology (1986) 118:82-90
#title      Isolation of fibroblast growth factor from bovine adrenal
            gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession  A61094
#molecule_type protein
#residues   12-25;27-35,'X',37-40 #label GOS
#experimental_source adrenal gland
REFERENCE
#authors    Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
            L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
            R.
#journal    Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title      Primary structure of bovine pituitary basic fibroblast growth
            factor (bFGF) and comparison with the amino-terminal
            sequence of bovine brain acidic bFGF.
#cross-references MUID:86016731
#accession  A01386
#molecule_type protein
#residues   12-157 #label ESC
#experimental_source pituitary gland
REFERENCE
#authors    Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
            Regul. Pept. (1985) 12:201-213
#journal    Isolation and partial characterization of an endothelial cell
            growth factor from the bovine kidney: homology with basic
            fibroblast growth factor.
#cross-references MUID:86095426
#accession  A60316
#molecule_type protein
#residues   27-35,'X',37-43 #label BAI
#experimental_source kidney
REFERENCE
#authors    Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
            Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#journal    Isolation and partial molecular characterization of pituitary
            fibroblast growth factor.
#cross-references MUID:84298139
#accession  A22054
#molecule_type protein
#residues   12-26 #label BOH
COMMENT      The acidic and basic fibroblast growth factors are the major
            endothelial-cell growth factors. Both are angiogenic agents in
            vivo and are potent mitogens for a variety of mesoderm-derived
            cell types in vitro (although bFGF is 30-100 times more potent
            than aFGF in stimulating the proliferation of normal diploid
            cells).
COMMENT      This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS        alternative splicing; angiogenesis; growth factor; heparin
            binding; mitogen
FEATURE
1-157          #product basic fibroblast growth factor, uterine form
4-157          #status predicted #label MAT1\
            #product basic fibroblast growth factor, pituitary gamma
            form #status experimental #label MAT2\
12-157        #product basic fibroblast growth factor, pituitary alpha
            form #status experimental #label MAT3\
16-157        #product basic fibroblast growth factor, pituitary short
            form #status predicted #label MAT4\
23-157        #product basic fibroblast growth factor, hepatic form
            #status experimental #label MAT5\
27-157        #product basic fibroblast growth factor, renal form

```

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29-33,118-121 #status experimental #label MAT6\
4             #region heparin binding #status predicted\
            #modified_site blocked amino end (Ala) (in mature form
            pituitary gamma) (probably acetylated) #status
            experimental
SUMMARY      #length 157 #checksum 1115
Query Match 32.48; Score 516; DB 1; Length 157;
Best Local Similarity 55.28; Pred. No. 3.12e-82;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 26 GHFKDPRRLCKKGGFLRIHPDGRVDGVRKSDPHIKLQQAEEGWISIKVCANRYL 85
      ::: || || || || || || || || || || || || || || || || || ||
QY 87 ANYKKPKLLYCSNGGHEFLRLPDGTVDGTRDSQDHLQLQLSAESGEVVIKSTETQYL 146
      :|| || || || || || || || || || || || || || || || || ||
Db 86 AMKEDGRLLASKVTDCEFFERLESNNYTYRSKYVS--SWYVALKRTQGYKLGPKTGP 143
      || || || || || || || || || || || || || || || || || ||
QY 147 AMDTDGLLYGSGTPNECLERLEENHYNTYISKHAENWFWGLKKGSKRGPRTHY 206
      || || || || || || || || || || || || || || || || || ||
Db 144 GKAILFLPMSAKS 157
      || || || || || || || || || || || || || || || || || ||
QY 207 GKAILFLPLPVSS 220
      || || || || || || || || || || || || || || || || || ||
RESULT 13      A32398 #type complete
ENTRY         basic fibroblast growth factor precursor, 22.5K form - human
TITLE         bFGF; fibroblast growth factor 2; prostatic growth factor;
ALTERNATE_NAMES prostatin
CONTAINS      basic fibroblast growth factor, 18K form
ORGANISM      #formal_name Homo sapiens #common_name man
DATE          31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
ACCESSIONS    A32398; A61537; A26642; B32878; S00297; A54316; B54316;
              A33624; A25824; B24243; B24301; S42242; B55784; I52267;
              S46253
REFERENCE     A32398
#authors      Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
              J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
              Smith, J.A.; Caput, D.
#journal      Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title        High molecular mass forms of basic fibroblast growth factor
              are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession    A32398
#molecule_type mRNA
#residues     1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE     A61537
#authors      Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal      Growth Factors (1991) 4:277-287
#title        Functional characterization of the human basic fibroblast
              growth factor gene promoter.
#cross-references MUID:92110035
#accession    A61537
#molecule_type DNA
#residues     1-114 #label SHI
#note         authors translated the codon G3A for residue 47 as Ala
REFERENCE     A26642
#authors      Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal      FEBS Lett. (1987) 213:189-194
#title        Cloning and expression of cDNA encoding human basic
              fibroblast growth factor.
#cross-references MUID:87162468
#accession    A26642
#molecule_type mRNA
#residues     56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE     A90924
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
              J.C.
#journal      Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title        Human basic fibroblast growth factor: nucleotide sequence,

```

```

#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 ##label ABR
#note the authors translated the codon GAA for residue 108 as Gly

REFERENCE
#authors S00297
#journal Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman, J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 ##label AB2
#note the authors translated the codon GAA for residue 108 as Gly

REFERENCE
#authors A54316
#journal Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.; Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic fibroblast growth factor produced by hepatocellular carcinoma cells: possible involvement of basic fibroblast growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX', '86-88', 'X', '90-91', 'X', '93-95' ##label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note #experimental_source sequence extracted from NCBI backbone (NCBIP:71595)

REFERENCE
#authors B54316
#molecule_type protein
#residues 'XXX', '19', 'X', '21-29' ##label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)

REFERENCE
#authors A33624
#journal Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens, L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on the phosphorylation of basic fibroblast growth factor by protein kinase C and the catalytic subunit of protein kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 ##label FEI

REFERENCE
#authors A25824
#journal Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs, S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast growth factor isolated from human benign prostatic hyperplastic tissue.
#cross-references MUID:87156686
#accession A25824
#molecule_type protein
#residues 57-77 ##label STO
#experimental_source prostate

REFERENCE
#authors A90122
#journal Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities.
#cross-references MUID:86186784
#accession B24243
#molecule_type protein
#residues 65-102, 'X', '104-105' ##label GIM

```

```

#experimental_source brain
REFERENCE
#authors A91364
#journal Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#title Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors.
#cross-references MUID:86275260
#accession B24301
#molecule_type protein
#residues 65-98, 'X', '90-98', 'X', '100' ##label GAU

REFERENCE
#authors S42242
#journal Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.; Presta, M.; Rifkin, D.B.
#journal Biochem. Biophys. Res. Commun. (1987) 144:543-550
#title A form of human basic fibroblast growth factor with an extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 ##label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1; PID:g183087

REFERENCE
#authors A5784
#journal Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk, D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian, A.T.; Bradley, J.D.; Sisk, W.P.
#journal Biochemistry (1994) 33:10229-10248
#title Multivalent ligand-receptor binding interactions in the fibroblast growth factor system produce a cooperative growth factor and heparin mechanism for receptor dimerization.
#cross-references MUID:94347757
#accession B5784
#molecule_type protein
#residues 54-71 ##label PAN

REFERENCE
#authors I52267
#journal Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson, G.M.; Thomas, E.J.
#journal Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#title Reverse transcription with nested polymerase chain reaction shows expression of basic fibroblast growth factor transcripts in human granulosa and cumulus cells from in vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DBDJB
#molecule_type mRNA
#residues 95-182 ##label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells

REFERENCE
#authors S46253
#journal Patry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
#journal FEBS Lett. (1994) 349:23-28
#title Purification and characterization of the 210-amino acid recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639
#accession S46253
#molecule_type protein
#residues 39-53; 65-88 ##label PAT
#note recombinant gene expressed in Escherichia coli

GENETICS
#gene GDB:FGF2; FGF8
#cross-references GDB:I19910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
#CLASSIFICATION #superfamily fibroblast growth factor
#KEYWORDS alternative initiators; angiogenesis; growth factor; heparin binding; mitogen

FEATURE
1-210
#product basic fibroblast growth factor, 22.5K form
#status predicted #label MA2\

```



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65-210      #product basic fibroblast growth factor, 18K form
82-86      #status predicted #label MAT\
171-174    #region heparin binding #status predicted\
SUMMARY    #region heparin binding #status predicted
           #length 210 #molecular-weight 22623 #checksum 3610
Query Match 32.0%; Score 509; DB 2; Length 210;
Best Local Similarity 54.5%; Pred. No. 9,93e-81;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 79 GHFKDPKRLKCKNGGFLRIHPDGRVDGVREKSDPHIKLQLOAEERGVSIGKVCANRYL 138
  ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 87 ANYKKPKLLYCSNGGHFLRIPLDGTVDGTRDSQHIQLQLSAESVGEVIKSTETGYL 146
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 139 AMKEDGRLASKCVTDECFERLESNNYTSRKYI--SWYVALKRTGYKLGSKTGP 196
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNCKRGKRPRTY 206
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 197 GOKAILFLPMSAKS 210
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
207 GOKAILFLPLPVSS 220
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

RESULT 14
ENTRY      A31674      #type complete
TITLE      basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM   #formal_name Rattus norvegicus #common_name Norway rat
DATE       21-May-1990 #sequence_revision 21-May-1990 #text_change
           16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE  A31674
  #authors  Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
            Cooksey, K.; Baird, A.; Ling, N.
  #journal  Biochem. Biophys. Res. Commun. (1988) 157:256-263
  #title    Complementary DNA cloning and sequencing of rat ovarian basic
            fibroblast growth factor and tissue distribution study of
            its mRNA.
  #cross-references MUID:89061721
  #accession A31674
  #molecule_type mRNA
  #residues 1-154 #label SHI
  #cross-references GB:M22427; NID:g204285; PIDN:AAA41210.1; PID:g204286
REFERENCE  S00876
  #authors  Kurokawa, T.; Seno, M.; Igarashi, K.
  #journal  Nucleic Acids Res. (1988) 16:5201
  #title    Nucleotide sequence of rat basic fibroblast growth factor
            cDNA.
  #cross-references MUID:88262516
  #accession S00876
  #molecule_type mRNA
  #residues 1-154 #label KUR
  #cross-references EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204
REFERENCE  S24309
  #authors  El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
  #journal  Biochim. Biophys. Acta (1992) 1131:314-316
  #title    PCR detection of the rat brain basic fibroblast growth factor
            (bFGF) mRNA containing a unique 3' untranslated region.
  #cross-references MUID:92329546
  #accession S24309
  #status   preliminary; translation not shown
  #molecule_type mRNA
  #residues 35-154 #label ELH
  #cross-references EMBL:X61697; NID:g56143; PIDN:CAA43863.1; PID:g56144
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS
FEATURE
1-9          #domain signal sequence #status predicted #label SIG\
10-154       #product basic fibroblast growth factor #status
            predicted #label MAT\
SUMMARY      #length 154 #molecular-weight 17139 #checksum 3026
Query Match 31.9%; Score 508; DB 2; Length 154;

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Best Local Similarity 54.5%; Pred. No. 1.63e-80;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLKCKNGGFLRIHPDGRVDGVREKSDPHVKLQLOAEERGVSIGKVCANRYL 82
  ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 87 ANYKKPKLLYCSNGGHFLRIPLDGTVDGTRDSQHIQLQLSAESVGEVIKSTETGYL 146
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 83 AMKEDGRLASKCVTDECFERLESNNYTSRKYI--SWYVALKRTGYKLGSKTGP 140
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNCKRGKRPRTY 206
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 141 GOKAILFLPMSAKS 154
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 207 GOKAILFLPLPVSS 220
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

RESULT 15
ENTRY      C37360      #type complete
TITLE      basic fibroblast growth factor - mouse
ORGANISM   #formal_name Mus musculus #common_name house mouse
DATE       17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
           16-Jul-1999
ACCESSIONS C37360
REFERENCE  A37360
  #authors  Hebert, J.M.; Basillco, C.; Goldfarb, M.; Haub, O.; Martin,
            G.R.
  #journal  Dev. Biol. (1990) 138:454-463
  #title    Isolation of cDNAs encoding four mouse FGF family members and
            characterization of their expression patterns during
            embryogenesis.
  #cross-references MUID:90201563
  #accession C37360
  #status   preliminary
  #molecule_type mRNA
  #residues 1-154 #label HEB
  #cross-references GB:M30644; NID:g193296; PIDN:AAA37621.1; PID:g309239
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 154 #molecular-weight 17153 #checksum 2506

Query Match 31.9%; Score 508; DB 2; Length 154;
Best Local Similarity 54.5%; Pred. No. 1.63e-80;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLKCKNGGFLRIHPDGRVDGVREKSDPHVKLQLOAEERGVSIGKVCANRYL 82
  ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 87 ANYKKPKLLYCSNGGHFLRIPLDGTVDGTRDSQHIQLQLSAESVGEVIKSTETGYL 146
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 83 AMKEDGRLASKCVTDECFERLESNNYTSRKYI--SWYVALKRTGYKLGSKTGP 140
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNCKRGKRPRTY 206
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 141 GOKAILFLPMSAKS 154
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 207 GOKAILFLPLPVSS 220
  ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Search completed: Tue Aug 29 15:40:25 2000
Job time : 54 secs.

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W P E L

(TM)

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MPSrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:40:42 2000; MasPar time 8.10 Seconds
Tabular output not generated. 646.314 Million cell updates/sec

Title: >US-09-121-017B-1
Description: (1-221) from US09121017B.ppt
Perfect Score: 1593
Sequence: 1 NAPARLALLFFVGGVAES.....PRTHYGQKAILFLPLPVSSD 221

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: A-genesag36
1:geneseqp

Statistics: Mean 32.257; Variance 136.606; scale 0.236

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				SUMMARIES	
Result No.	Score	Query Match Length DB ID	Description	Pred. No.	
1	984	61.8	140	1 R25914 Human acidic fibroblasts	4.61e-84
2	984	61.8	140	1 R34437 Human acidic fibroblasts	4.61e-84
3	984	61.8	140	1 P90068 Human acid fibroblast	4.61e-84
4	984	61.8	140	1 R74647 Human recombinant aFGF	4.61e-84
5	984	61.8	140	1 W04806 Human acidic fibroblasts	4.61e-84
6	984	61.8	140	1 P70995 Sequence of human prot	4.61e-84
7	984	61.8	141	1 R10527 Human acidic fibroblasts	4.61e-84
8	984	61.8	151	1 R05789 Human aFGF encoded by	4.61e-84
9	984	61.8	151	1 W92283 Human beta-endothelial	4.61e-84
10	984	61.8	154	1 W04805 Human beta-endothelial	4.61e-84
11	984	61.8	154	1 W06816 Human endothelial cell	4.61e-84
12	984	61.8	154	1 W75414 Human beta-endothelial	4.61e-84
13	984	61.8	155	1 P94037 Human acidic fibroblasts	4.61e-84
14	984	61.8	155	1 R70812 FGF-1	4.61e-84
15	984	61.8	155	1 R70812 Sequence encoded by co	4.61e-84
16	984	61.8	155	1 R80776 Fibroblast growth fact	4.61e-84
17	984	61.8	155	1 W53022 Fibroblast growth fact	4.61e-84
18	984	61.8	155	1 W75711 Fibroblast growth fact	4.61e-84
19	984	61.8	155	1 W75415 Human endothelial cell	4.61e-84
20	984	61.8	155	1 W92291 Human endothelial cell	4.61e-84
21	984	61.8	165	1 R05785 Human BEGF encoded by	4.61e-84
22	984	61.8	168	1 W06818 Human endothelial cell	4.61e-84
23	983	61.7	134	1 W75413 Human alpha-endothelia	5.80e-84

24	983	61.7	134	1 W92282 Human alpha-endothelia	5.80e-84
25	983	61.7	134	1 W04807 Human alpha-endothelia	5.80e-84
26	973	61.1	156	1 W71383 Fibroblast growth fact	5.75e-83
27	972	61.0	135	1 W06817 Human endothelial cell	7.24e-83
28	960	60.3	132	1 R11327 9 N-terminal residue d	1.13e-81
29	960	60.3	132	1 R25418 aFGF mutein #2.	1.13e-81
30	953	59.8	155	1 R25570 Recombinant human Ala1	5.64e-81
31	953	59.8	155	1 W00561 Human (Gly93) aFGF ana	1.78e-80
32	948	59.5	140	1 R65935 Fibroblast growth fact	1.78e-79
33	938	58.9	139	1 R25419 aFGF mutein #3.	1.76e-79
34	938	58.9	139	1 R11328 12 N-terminal residue	1.76e-79
35	923	57.9	140	1 R34496 Bovine acidic fibrobla	5.45e-78
36	923	57.9	140	1 R13030 Brain-derived acidic f	5.45e-78
37	923	57.9	140	1 R74648 Bovine recombinant aFG	5.45e-78
38	923	57.9	140	1 P90069 Bovine acidic fibrobla	5.45e-78
39	923	57.9	140	1 R25915 Human acidic fibroblas	5.45e-78
40	923	57.9	140	1 R65934 Bovine fibroblast grow	5.45e-78
41	921	57.8	154	1 R05315 Human acidic fibroblas	8.62e-78
42	915	57.4	154	1 P90074 Recombinant human muta	3.40e-77
43	912	57.3	141	1 R25569 Recombinant bovine Ala	6.77e-77
44	912	57.3	141	1 W00560 Bovine (Ala47,Gly93) a	6.77e-77
45	900	56.5	136	1 W01747 Chimeric acid/basic fi	1.05e-75

ALIGNMENTS

RESULT 1
ID R25914 standard; peptide; 140 AA.
AC R25914; 134 (first entry)
DE Human acidic fibroblast growth factor.
KW herpes varicella; herpes zoster; cytomegalovirus; Influenza;
KW human respiratory syncytial virus; Semliki Forest virus; HIV;
KW human immunodeficiency virus; Moloney Sarcoma virus.
OS Homo sapiens.
PN EP-497341-A.
PD 05-AUG-1992.
PF 30-JAN-1992; 101541.
PR 31-JAN-1991; GB-002145.
PR 09-JAN-1992; GB-000410.
PR (FARM) FARMITALIA ERBA SRL CARLO.
PI Battistini C, Carminati P, Garofano L, Marue G, Ungheri D;
DI WPI; 92-260792/32.
PT Synergistic antiviral composition contains: BFGF and sulphated
PT polysaccharide - for treating viral infections e.g. HSV-1 and -2,
PT cytomegalovirus, HIV, Influenza virus etc.
PS Disclosure: Page 4; 20pp; English.
CC This sequence represents acidic fibroblast growth factor (aFGF).
CC aFGF, or its fragments may be used in a synergistic compsn. with an
CC antivirally active sulphated polysaccharide, and one or more
CC excipients. The compsn. may be used to control herpes simplex virus
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; Influenza;
CC human respiratory syncytial virus; Semliki Forest virus; HIV or
CC Moloney Sarcoma virus. The combination of aFGF with sulphated
CC polysaccharide is found to have a greater antiviral activity than
CC expected for an additive effect. See also X:5913-5.
SQ Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;
Best Local Similarity 99.3%; Pred. No. 4.61e-84;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB	6	GNVKKPLLYCSNGGHFLRLPDPGTVDGTRDSQDHIQLQLSAESVGEVYIKSTETGQYL	65
QY	87	ANTYKPKLLYCSNGGHFLRLPDPGTVDGTRDSQDHIQLQLSAESVGEVYIKSTETGQYL	146
DB	66	AMTDGLLYCSQTPNECEFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY	125
QY	147	AMTDGLLYCSQTPNECEFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY	206
DB	126	GKAILFLPLPVSSD 140	

QY 207 GQKAILFLPLVSSD 221

RESULT 2

ID R34497 standard; protein; 140 AA.

AC R34497;

DT 06-AUG-1993 (first entry)

DE Human acidic fibroblast growth factor.

KW aFGF; mutin; glycosylation site; glycoprotein.

OS Homo sapiens.

PN J05076356-A.

PD 30-MAY-1991; 127435.

PR 31-MAY-1990; JP-143388.

PA (TAKE) TAKEDA CHEM IND LTD.

DR WPI; 93-139564/17.

PT FGF mutin prep. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF mutin

PS Disclosure; Page 3; 23pp; Japanese.

CC The invention covers mutins of FGF (esp. bFGF) which contain at least one glycosylation site. The mutins can be used to treat burns and thrombosis.

QY Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLVSSD 140

QY 207 GQKAILFLPLVSSD 221

RESULT 3

ID P90068 standard; protein; 140 AA.

AC P90068;

DT 1-NOV-1989 (first entry)

DE Human acid fibroblast growth factor

KW Homo sapiens

OS Homo sapiens

PN EP-319052-A.

PD 14-JUN-1989.

PR 14-OCT-1988; 202306.

PA (MERI) Merck and Co.

PI Thomas Jnr KA, Linemeyer DL;

DR WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor

PS used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.

CC Disclosure; page 4; 36pp; English.

CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.

QY Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLVSSD 140

QY 207 GQKAILFLPLVSSD 221

RESULT 4

ID R74647 standard; protein; 140 AA.

AC R74647;

DT 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnary; angiogenesis; mitogen.

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PR 24-DEC-1984; US-685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1988; US-190293.

PR 08-FEB-1991; US-654397.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

DR WPI; 95-138983/718.

PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair

PS Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating codons preferred by E. coli or mammalian cells, unique cloning sites, etc. This synthetic gene was mutagenized to obtain a gene encoding a human recombinant aFGF (R74647) having activity equivalent to the native protein.

QY Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLVSSD 140

QY 207 GQKAILFLPLVSSD 221

RESULT 5

ID W04806 standard; Protein; 140 AA.

AC W04806;

DT 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; heparin-Sepharose affinity chromatography; probe; oligonucleotide; FGF; fibroblast growth factor; ss.

OS Homo sapiens.

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLVSSD 140

QY 207 GQKAILFLPLVSSD 221

RESULT 4

ID R74647 standard; protein; 140 AA.

AC R74647;

DT 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnary; angiogenesis; mitogen.

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PR 24-DEC-1984; US-685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1988; US-190293.

PR 08-FEB-1991; US-654397.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

DR WPI; 95-138983/718.

PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair

PS Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating codons preferred by E. coli or mammalian cells, unique cloning sites, etc. This synthetic gene was mutagenized to obtain a gene encoding a human recombinant aFGF (R74647) having activity equivalent to the native protein.

QY Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTGTQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLVSSD 140

QY 207 GQKAILFLPLVSSD 221

RESULT 5

ID W04806 standard; Protein; 140 AA.

AC W04806;

DT 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; heparin-Sepharose affinity chromatography; probe; oligonucleotide; FGF; fibroblast growth factor; ss.

OS Homo sapiens.

PN US5552528-A.
 PD 03-SEP-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PI (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Maciag T;
 WPI: 96-412132/41.
 DR N-PSDB: T37503.
 PT Isolated, purified, biologically active bovine beta endothelial cell
 PT growth factor - useful to regenerate or treat damaged blood vessels
 PS Disclosure: Fig 8; 28pp; English.
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03599) having
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
 CC brain using heparin-Sepharose affinity chromatography. ECGF is
 CC useful for, among other purposes, diagnostic applications and has
 CC potential in the treatment of damaged blood vessels or other
 CC endothelial cell-lined structures.
 CC Human ECGF (T37503) or fragments may be obtained using
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
 CC on the sequence of bovine alpha- and beta-ECGF.
 SQ Sequence 140 AA;
 Query Match 61.8%; Score 984; DB 1; Length 140;
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
 Db 6 GNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIOQLQLSAESVGEVIKSTETGOYL 65
 QY :|||||
 Db 87 ANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIOQLQLSAESVGEVIKSTETGOYL 146
 QY :|||||
 Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125
 QY :|||||
 Db 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206
 QY :|||||
 Db 126 GOKAILFLPLPVSSD 140
 QY :|||||
 Db 207 GOKAILFLPLPVSSD 221
 QY :|||||
 RESULT 7
 ID R10527 standard; Protein; 141 AA.
 AC R10527;
 DT 15-APR-1991 (first entry)
 DE Human acidic fibroblast growth factor gene.
 KW aFGF; anti-bdy; antigen; cancer; ss.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT region 2..12
 FT /label= A
 FT region 56..67
 FT /label= B
 FT region 104..114
 FT /label= C
 FT region 132..141
 FT /label= D
 PN J02306996-A.
 PD 20-DEC-1990.
 PF 03-JUL-1989; 172542.
 PR 04-JUL-1988; JP-166275.
 PR 03-JUL-1989; JP-172542.
 PA (TAKE) TAKEDA CHEMICAL IND KK.
 DR WPI: 91-040150/06.
 DR N-PSDB: Q10399.
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obt'd. by
 PT using complex of partial peptide(s) of acid fibroblast growth
 PT factor and protein as antigen.
 PS Disclosure; Fig 1; 19pp; Japanese.
 CC The was deduced from a gene used to produce recombinant aFGF.
 CC Peptides derived from the protein, esp. from A-D can be used to as
 CC antigens to produce anti-aFGF antibodies. The peptides must
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,
 CC and for purifying aFGF. They are useful as reagents in the diag-
 CC nosis of various cancers or diseases of the CNS. Purified aFGF
 CC has wound healing and nerve cell proliferating properties.
 SQ Sequence 141 AA;
 Query Match 61.8%; Score 984; DB 1; Length 141;
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
 Db 7 GNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIOQLQLSAESVGEVIKSTETGOYL 66
 QY :|||||
 Db 87 ANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIOQLQLSAESVGEVIKSTETGOYL 146
 QY :|||||
 Db 67 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 126
 QY :|||||
 Db 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206
 QY :|||||
 Db 127 GOKAILFLPLPVSSD 141
 QY :|||||
 Db 207 GOKAILFLPLPVSSD 221
 QY :|||||
 RESULT 8
 Query Match 61.8%; Score 984; DB 1; Length 140;
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
 Db 6 GNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIOQLQLSAESVGEVIKSTETGOYL 65
 QY :|||||
 Db 87 ANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIOQLQLSAESVGEVIKSTETGOYL 146
 QY :|||||
 Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125
 QY :|||||
 Db 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206
 QY :|||||
 Db 126 GOKAILFLPLPVSSD 140
 QY :|||||
 Db 207 GOKAILFLPLPVSSD 221
 QY :|||||
 RESULT 6
 ID P70995 standard; protein; 140 AA.
 AC P70995;
 DT 13-JUN-1991 (first entry)
 DE Sequence of human proteinaceous factor (PFI) with mitogenic activity.
 KW cell growth promoter; mitogen; vascularisation; wound healing.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT misc_difference 140
 FT /label= Asp-OH
 PN EP-241136-A.
 PD 14-OCT-1987.
 PF 06-MAR-1987; 301969.
 PR 07-MAR-1986; US-838096.
 PA (HARD) HARVARD COLLEGE.
 PI Lobb RR, Harper JW, Strydom DJ;
 WPI: 87-285995/41.
 PT Mitogenic polypeptide isolated from human brain tissue - useful
 PT for increasing vascular effect in eg wound healing, or
 PT generating endothelial cell linings for vascular prostheses, etc.
 Claim 3; Page 1; 31pp; English.
 The PF of the invention was obt'd. from human brain tissue. It has a
 1. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
 2. ty for heparin. PFI and fragments are useful for promoting the
 3. mesoderm-derived cells or neuroectoderm-derived cells and
 4. endothelial cell linings for vascular prostheses (all
 5. 'peptides are useful for increasing vascularisation.

IO5789 standard; Protein; 151 AA.
AC R05789;
DE 22-AUG-1990 (first entry)
KW Human aFGF encoded by synthetic gene.
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;
KW atherosclerosis; tumors.
OS Synthetic.
FH Key Location/Qualifiers
FT misc_difference 146..147
FT /note= "sites corresp. to two stop codons of
FT the DNA sequence"
PD GB223496-A.
PD 11-APR-1990.
PD 08-AUG-1988; 018775.
PD 08-AUG-1988; GB-018775.
PA (BRI-) Brit Bio-Tech Ltd.
PI Davies JA, Johnson ID;
DR WPI; 90-109882/15.
DR N-PSDB; Q03873.
DE Gene encoding human acidic fibroblast growth factor -
DE incorporates useful restriction sites at frequent intervals to
DE facilitate cassette mutagenesis of specified regions.
PS Claim 2; Fig 3a; 12pp; English.
CC The synthetic aFGF gene incorporates useful restriction sites at
CC frequent intervals to facilitate the cassette mutagenesis of
CC selected regions. Also included are flanking sites to simplify
CC the incorporation of the gene into any expression system.
CC The aFGF mol. acts in a cascade effect to control endothelial cell
CC activity either co-ordinately through synergistic effects or via
CC independent routes. The regulation of endothelial cells is essential
CC for the protection of arteries, veins and capillaries from the effect
CC of thrombogenesis. Their stimulation and control by these factors is
CC also thought to be important in the development of tumours and
CC atherosclerosis.
SQ Sequence 151 AA;
Query Match 61.8%; Score 984; DB 1; Length 151;
Best Local Similarity 99.3%; Pred. No. 4.61e-84;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 11 GNYKPKLLYCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 70
QY :|||||
87 ANYKPKLLYCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 146
Db 71 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 130
QY 147 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 206
131 GOKAILFLPLPVSSD 145
207 GOKAILFLPLPVSSD 221
RESULT 9
ID W92283 standard; protein; 154 AA.
AC W92283;
DE 20-APR-1999 (first entry)
KW Human beta-endothelial cell growth factor (ECGF) protein sequence.
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
KW regenerate; blood vessel; endothelial cell; human.
OS Homo sapiens.
PN US5849538-A.
PD 15-DEC-1998.
PD 11-APR-1997;
PD 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PR 11-APR-1997; US-840088.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, Maciag T;
DR WPI; 99-069734/06.
DE DNA encoding a cleavable signal peptide and an endothelial cell
DE growth factor - useful for producing recombinant endothelial cell
DE growth factor proteins
PS Claim 1; Column 16; 23pp; English.
CC This represents the amino acid sequence of human beta-endothelial cell
CC growth factor (ECGF). The invention is directed to DNA encoding alpha-
CC or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a
CC cleavable signal peptide and an ECGF, where removal of the signal peptide
CC yields a mature form of the ECGF. The DNA is used to produce recombinant
CC ECGF proteins, which can be used in treatments to repair or regenerate
CC blood vessels or other structures lined with endothelial cells.
SQ Sequence 154 AA;
Query Match 61.8%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 4.61e-84;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 20 GNYKPKLLYCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 79
QY :|||||
87 ANYKPKLLYCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 146
Db 80 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 139
QY 147 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 206
140 GOKAILFLPLPVSSD 154
207 GOKAILFLPLPVSSD 221
RESULT 10
ID W04805 standard; Protein; 154 AA.
AC W04805;
DE 29-DEC-1996 (first entry)
DE Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PD 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI; 96-412132/41.
DR N-ESDB; T37503.
DE Isolated, purified, biologically active bovine beta endothelial cell
DE growth factor - useful to regenerate or treat damaged blood vessels
DE Disclosure; Fig 8; 28pp; English.
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 154 AA;
Query Match 61.8%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 4.61e-84;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 20 GNYKPKLLYCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 79
QY :|||||

QY 87 ANYKKPKLLYCSNGGHHFLRLIPDGTVDGTRDRSDQHIOQL:SAESVGEVYIKSTETGOYL 146
 DB 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKFWFVGLKNGSKRGPRTHY 139
 QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKFWFVGLKNGSKRGPRTHY 206
 DB 140 GOKAILFLPLPVSSD 154
 QY 207 GOKAILFLPLPVSSD 221

RESULT 11

ID W06816 standard; Protein; 154 AA.
 AC W06816;
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor-beta.
 KW Endothelial cell growth factor-beta; ECGF-beta.
 OS Homo sapiens.
 PN US5571790-A.
 IN 05-NOV-1996.
 PR 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 96-505421/50.
 DR N-PSDB; T45983.
 PT Recombinant human endothelial cell growth factors - for treating
 PS damaged blood vessels, etc.
 PS Claim 1; Column 16: 22pp; English.
 CC Human recombinant endothelial cell growth factors (ECGF) beta
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
 CC They can be produced in transformed prokaryotic or eukaryotic host
 CC cells using DNA sequences (T45983 and T45984, respectively) derived
 CC from the complete human ECGF cDNA (T45985). Large quantities of
 CC the ECGFs are produced by culturing the host cells and recovering
 CC the proteins. ECGFs have utility in the growth and amplification
 CC of endothelial cells in culture. They can potentially be used to
 CC treat damaged blood vessels and other endothelial cell-lined
 CC structures, and also have diagnostic applns.
 SQ Sequence 154 AA;

Query Match 61.8%; Score 984; DB 1; Length 154;
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 20 GNYKKPKLLYCSNGGHHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 79
 QY 87 ANYKKPKLLYCSNGGHHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 146
 DB 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKFWFVGLKNGSKRGPRTHY 139
 QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKFWFVGLKNGSKRGPRTHY 206
 DB 140 GOKAILFLPLPVSSD 154
 QY 207 GOKAILFLPLPVSSD 221

RESULT 13

ID P94037 standard; protein; 155 AA.
 AC P94037;
 DT 25-JUN-1990 (first entry)
 DE Human acidic fibroblast growth factor.
 KW Acidic fibroblast growth factor.
 OS Homo sapiens.
 PN EP-298723-A.
 PD 11-JAN-1989.
 PF 06-JUL-1988; 306158.
 PR 07-JUL-1987; US-070797.
 PA (BIOT-) Biotech Res Assoc.
 PI Fiddes JC, Abraham JA, Protter A;
 DR WPI; 89-009785/02.
 DR N-PSDB; N93088.
 PT Recombinant DNA encoding new fibroblast growth factor
 PT analogues - useful eg for accelerating wound healing and
 PT to control neovascularisation.
 PS Disclosure; p; English.
 CC See also P94038.
 SQ Sequence 155 AA;

Query Match

61.8%; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 21 GNYKKPKLLYCSNGGHHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 80
 QY 87 ANYKKPKLLYCSNGGHHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 146
 DB 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKFWFVGLKNGSKRGPRTHY 140

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCRGPRTHY 206
Db 141 GOKAILFLPLPVSSD 155
QY 207 GOKAILFLPLPVSSD 221

RESULT 14

ID R70812 standard; protein; 155 AA.
AC R70812;
DT 01-SEP-1995 (first entry)
DE FGF-1;
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
OS Homo sapiens.
FH Key Location/Qualifiers
FT misc_difference 31
FT misc_difference 132 /note= "Cys may be replaced by Ser"
FT misc_difference 132 /note= "Cys may be replaced by Ser"
WO9503831-A.
09-FEB-1995.
27-JUL-1994; U08511.
PR 02-AUG-1993; US-099924.
PR 29-OCT-1993; US-145829.
PA (PRIZ-) PRIZM PHARM INC.
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
PI Baird AJ, Lappi DA, Sosnowski BA;
WPI: 95-082038/11.
DR New monogenous preparations of cytotoxic conjugates and DNA -
PT contain fibroblast growth factors and cytotoxic agents for
PT treating FGF conditions such as tumours, diabetes and rheumatoid
PT arthritis.
PS Disclosure: Page 108-109; 128pp; English.
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
CC by conservative Ser substitutions. The fusion proteins are potent
CC cytotoxic agents to cells bearing the FGF receptor.
SQ Sequence 155 AA;

Query Match 61.8%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 4.61e-84;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db: 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 80
QY: 87 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 146
81 AMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCRGPRTHY 140
QY 147 AMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCRGPRTHY 206
Db 141 GOKAILFLPLPVSSD 155
QY 207 GOKAILFLPLPVSSD 221

RESULT 15

ID P70482 standard; Protein; 155 AA.
AC P70482;
DT 13-MAY-1991 (first entry)
DE Sequence encoded by complete cDNA sequence of human endothelial
DE cell growth factor (ECGF).
KW Endothelial cell regeneration; blood vessel regeneration.
OS Homo sapiens.
FH Key Location/Qualifiers
FT Protein 2..15
FT /label= Beta ECGF
FT protein 16..21
FT /label= Acidic FGF
FT protein 22..155
FT /label= Alpha ECGF

PN WO8705332-A.
PD 11-SEP-1987.
PF 02-MAR-1987; U00425.
PR 03-MAR-1986; US-835594.
PR 26-MAR-1987; ES-000812.
PA (MELO-) MELOY LAB INC.
PA (RORE-) RORER BIOTECHN INC.
PA (RORE-) RORER.
PA BIOTECH INC.
PI Jaye M, Burgess W, Maciag T, Drohan W;
DR WPI: 87-264128/37.
DR N-PSDB: N70788
PT Human endothelial cell growth factor - produced by recombinant
PT DNA techniques, useful for wound healing
PS Example; Fig 8; 43pp; English.
CC To screen the human brain stem cDNA library for clones contg. ECGF
CC inserts, a specific oligonucleotide was designed. This
CC oligonucleotide was based upon a partial AA sequence analysis of
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3C sets
CC forth for comprison the AA sequence of cyanogen bromide-cleaved
CC bovine alpha and beta ECGF (P70834). The two clones that were
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
CC nucleotide sequence of these clones and the AA sequence deduced from
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
SQ Sequence 155 AA;

Query Match 61.8%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 4.61e-84;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 80
QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 146
81 AMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCRGPRTHY 140
QY 147 AMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCRGPRTHY 206
Db 141 GOKAILFLPLPVSSD 155
QY 207 GOKAILFLPLPVSSD 221

Search completed: Tue Aug 29 15:41:00 2000
Job time : 18 secs.

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MPsrch_pp  protein - protein database search, using Smith-Waterman algorithm
run on:      Tue Aug 29 15:37:43 2000;  Maspar time 8.45 Seconds
            810.692 Million cell updates/sec
tabular output not generated.

```

Sequence: 1 IAPARLFALLFFVGVAES.....PRTHYGOKAILFLPLPVSSD 221

Searched: 9551 segs, 30989116 residues

Database: ~~swissprot~~38
1:swissprot

Pred. No. 1. the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Sult No.	No.	Score	Query Matrn	Length	DB	ID	Description	Pred. No.
1	1	984	61.9	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH	2.66e-208
2	2	972	61.0	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH	2.88e-208
3	3	967	60.7	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH	5.29e-208
4	4	953	59.8	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH	1.82e-201
5	5	923	57.9	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH	6.80e-199
6	6	922	57.9	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH	1.21e-199
7	7	608	38.2	198	1	SDC4_HUMAN	SYNDECAN-4 PRECURSOR (2.38e-111
8	8	522	32.8	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH	2.34e-94
9	9	516	32.4	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH	6.64e-93
10	10	516	32.4	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH	6.64e-93
11	11	509	32.0	155	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH	3.28e-91
12	12	508	31.9	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH	5.73e-91
13	13	508	31.9	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH	5.73e-91
14	14	498	31.3	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH	5.73e-91
15	15	489	30.7	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH	1.49e-88
16	16	466	29.3	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH	2.21e-86
17	17	394	24.7	202	1	SDC4_RAT	HEPARIN-BINDING GROWTH	7.44e-81
18	18	364	22.8	109	1	FGF9_XENLA	SYNDECAN-4 PRECURSOR (9.49e-64
19	19	360	22.6	108	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR	9.91e-57
20	20	360	22.6	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR	8.44e-56
21	21	360	22.6	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR	8.44e-56
22	22	359	22.7	198	1	SDC4_MOUSE	SYNDECAN-4 PRECURSOR (1.44e-55
23	23	329	20.7	207	1	FGF9_HUMAN	FIBROBLAST GROWTH FACT	1.21e-48

Query Match 61.8%; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 2.66e-209;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPLLYCSNGGHLRLPDGTVGTRSDQHIOQLSASVGEVYIKSTETGOYL 80
 :|||||
 Qy 87 ANYKKPLLYCSNGGHLRLPDGTVGTRSDQHIOQLSASVGEVYIKSTETGOYL 146
 :|||||

Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 140
 :|||||
 Qy 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206
 :|||||

Db 141 GOKAILFLPLPVSSD 155
 :|||||
 Qy 207 GOKAILFLPLPVSSD 221
 :|||||

RESULT 2 STANDARD; PRT; 155 AA.
 ID FGF1_MOUSE
 PI0935;
 01-JUL-1989 (Rel. 11, Created)
 01-JUL-1989 (Rel. 11, Last sequence update)
 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF).
 GN FGF1 OR FGF-1 OR FGFA.
 OS Mus musculus (Mouse), and Rattus norvegicus (Rat).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC SPECIES=RAT;
 RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
 RA "The nucleotide sequence of rat heparin binding growth factor 1
 RT (HBGF-1).";
 RL Nucleic Acids Res. 17:2867-2867(1989).
 RN [2]
 RP SEQUENCE FROM N.A.
 RC SPECIES=MOUSE;
 RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
 RA "Isolation of cDNAs encoding four mouse FGF family members and
 RT characterization of their expression patterns during embryogenesis.";
 RL Dev. Biol. 138:454-463(1990).
 RN [3]
 RP SEQUENCE FROM N.A.
 RC SPECIES=MOUSE;
 RA Madai F., Hackshaw K.V., Chiu I.M.;
 RA "Cloning and characterization of the mouse Fgf-1 gene.";
 RL Gene 179:231-236(1996).
 RN [4]
 RP SEQUENCE FROM N.A.
 RC SPECIES=MOUSE; STRAIN=BALB/C;
 RA Alam K.Y., Frostholt A., Hackshaw K.V., Evans J.E., Rotter A.,
 RA Chiu I.M.;
 RA "Characterization of the 1B promoter of fibroblast growth factor 1
 RT and its expression in the adult and developing mouse brain.";
 RL J. Biol. Chem. 271:30263-30271(1996).
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -1- SUBUNIT: MONOMER.
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC This SWISS-PROT entry is copyright. It is produced through a collaboration
 CC between the Swiss Institute of Bioinformatics and the EMBL outstation -
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 CC use by non-profit institutions as long as its content is in no way
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 or send an email to license@isb-sib.ch).

DR ENBL; X14232; CAA32448.1; -
 DR ENBL; M30641; AAA37618.1; -
 DR ENBL; U36459; AAC52969.1; -
 DR ENBL; U36457; AAC52969.1; JOINED.
 DR ENBL; U36458; AAC52969.1; JOINED.
 DR ENBL; U67610; AAC52907.1; -
 DR PIR; S04147; S04147.
 DR PIR; D37360; D37360.
 DR HSP; P05230; ZAXM.
 DR MGD; MGI:95515; FGF1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGEFG.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 15
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;

Query Match 61.0%; Score 972; DB 1; Length 155;
 Best Local Similarity 95.0%; Pred. No. 2.88e-206;
 Matches 132; Conservative 4; Mismatches 2; Indels 1; Gaps 1;

Db 18 LPL-GNYKKPLLYCSNGGHLRLPDGTVGTRSDQHIOQLSASVGEVYIKSTET 76
 :||:|||||
 Qy 83 VPLDANYKKPLLYCSNGGHLRLPDGTVGTRSDQHIOQLSASVGEVYIKSTET 142
 :||:|||||

Db 77 GOYLANDTEGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRG 136
 :|||||
 Qy 143 GOYLANDTEGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRG 202
 :|||||

Db 137 RTHYGKAILFLPLPVSSD 155
 :|||||
 Qy 203 RTHYGKAILFLPLPVSSD 221
 :|||||

RESULT 3 STANDARD; PRT; 155 AA.
 ID FGF1_MESAU
 AC P34004;
 DT 01-FEB-1994 (Rel. 28, Created)
 DT 01-FEB-1994 (Rel. 28, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF).
 GN FGF1 OR FGF-1.
 OS Mesocricetus auratus (Golden hamster).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;
 OC Mesocricetus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 90270291.
 RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;
 RA "Characterization of the hamster DDT-1 cell afGF/HBGF-I gene and cDNA
 RT and its modulation by steroids.";
 RL J. Cell. Biochem. 43:17-26(1990).
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -1- SUBUNIT: MONOMER.
 CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC PIR; A60721; A60721.
 DR HSP; P05230; ZAXM.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.

DR PRINTS: PR00263; HBGF-FGF.
DR PROSITE: PS00247; HBGF-FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15 BY SIMILARITY.
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

Query Match 60.7%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 5.29e-205;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTVDRSDQHIOQLSAGSAGEVYIKTGTGOYL 80
QY 87 ANYKKPKLLYCSNGGHFLRILPDGTVDRSDQHIOQLSAGSAGEVYIKTGTGOYL 146
Db 81 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKHAENWVGLKKNKSGCKRGPRTHY 140
147 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKHAENWVGLKKNKSGCKRGPRTHY 206
Db 141 GOKAILFLPLVSSD 155
QY 207 GOKAILFLPLVSSD 221

RESULT 4
ID FGFL_PIG STANDARD; PRT; 152 AA.
AC P20002;
DT 01-FEB-1991 (Rel. 17, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR)
DE (FRAGMENT).
GN Sus scrofa (Pig).
OS Sus scrofa (Pig).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Suidae; Sus.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=HEART;
RX MEDLINE; 92062117.
RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;
RT "Amplification and sequencing of mRNA encoding acidic fibroblast
RT growth factor (afgf) from porcine heart.";
RL Biochem. Biophys. Res. Commun. 180:853-859(1991).
RN [2]
RX SEQUENCE OF 22-41.
RX MEDLINE; 89231704.
RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethe N.,
RA Sharma H.S., Schaper W.;
RT "Isolation of heparin-binding growth factors from bovine, porcine and
RT canine hearts.";
RL Eur. J. Biochem. 181:67-73(1989).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES BFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC or send an email to license@sib-sib.ch).
CC EMBL; X60317; CAA42869.1;
DR

DR PIR; S03954; S03954.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR PROSITE; PS00247; HBGF-FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.
FT CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
FT CONFLICT 31 31 C -> S (IN REF. 2).
FT CONFLICT 39 39 R -> Y (IN REF. 2).
FT NON_TER 152 152
SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 59.8%; Score 953; DB 1; Length 152;
Best Local Similarity 97.0%; Pred. No. 1.82e-201;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTVDRSDQHIOQLSAGSAGEVYIKTGTGOYL 80
QY 87 ANYKKPKLLYCSNGGHFLRILPDGTVDRSDQHIOQLSAGSAGEVYIKTGTGOYL 146
Db 81 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKHAENWVGLKKNKSGCKRGPRTHY 140
147 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKHAENWVGLKKNKSGCKRGPRTHY 206
Db 141 GOKAILFLPLPV 152
QY 207 GOKAILFLPLPV 218

RESULT 5
ID FGFL_BOVIN STANDARD; PRT; 155 AA.
AC P03968;
DT 23-OCT-1986 (Rel. 02, Created)
DT 01-MAR-1989 (Rel. 10, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR
DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF
DE II).
GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Bovinae; Bos.
RN [1]
RX SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89083506.
RA Halley C., Courtois Y., Laurent M.;
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.";
RL Nucleic Acids Res. 16:10913-10913(1988).
RN [2]
RX SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89078619.
RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
RT "Characterization of a bovine acidic FGF cDNA clone and its
RT expression in brain and retina.";
RL FEBS Lett. 242:41-46(1988).
RN [3]
RX SEQUENCE OF 2-155.
RX MEDLINE; 87016918.
RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
RT "Structural evidence that endothelial cell growth factor beta is the
RT precursor of both endothelial cell growth factor alpha and acidic
RT fibroblast growth factor.";
RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
RN [4]
RX SEQUENCE OF 2-155.
RX MEDLINE; 87026586.

FT DOMAIN 171 198 CYTOPLASMIC (POTENTIAL).
 FT CARBOHYD 39 39 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CARBOHYD 61 61 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CARBOHYD 63 63 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CONFLICT 12 12 F -> L (IN REF. 1).
 SQ SEQUENCE 198 AA; 21641 MW; 8229AA2733F77A10 CRC64;

Query Match 38.2%; Score 608; DB 1; Length 198;
 Best Local Similarity 97.7%; Pred. No. 2.38e-115;
 Matches 86; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARFALLFFVGGVAISRETEVIDPDLLLEGYFSGALPDDDDVYVGGQESDDFEL 60
 QY 1 MAPARFALLFFVGGVAISRETEVIDPDLLLEGYFSGALPDDDDVYVGGQESDDFEL 60
 Db 61 SGSGDLDLSDSMIGPEVHPLVPLDNH 88
 QY 61 SGSGDLDLSDSMIGPEVHPLVPLDNH 88

RESULT 8
 FGF2 CHICK STANDARD; PRT; 158 AA.
 AC P48800;
 DT 01-FEB-1996 (Rel. 33, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).
 GN FGF2 OR FGF-2.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
 OC Gallus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 93246053.
 RA Borja A.Z., Zeller R., Meijers C.;
 RT "Expression of alternatively spliced bFGF first coding exons and antisense mRNAs during chicken embryogenesis.";
 RL Dev. Biol. 157:110-118(1993).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC EMBL; M95707; AAA48617.1;
 DR HSSP; P09038; IBFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGF.FGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 12 BY SIMILARITY.
 FT CHAIN 13 158 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 30 34 HEPARIN (POTENTIAL).
 FT BINDING 119 122 HEPARIN (POTENTIAL).
 SQ SEQUENCE 158 AA; 17374 MW; 7B9B684C17F1816 CRC64;

Query Match 32.8%; Score 522; DB 1; Length 158;
 Best Local Similarity 54.5%; Pred. No. 2.34e-94;
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 27 GHFKDPKRLYCKNGGFFLRINPDGRVYREKSDPHIKLQAEERGVVSIKGVSANREL 86
 QY 87 ANYKPKLLYCSNGGHFLRLPDGIVDGRSDQHIQLQLSAESVGEVYIKSTETGOYL 146
 Db 87 AKKEDGRLLAKCAEECFEFFFFLESNNYNTYRSKYS--WYVALKRTGQYKPKGTGP 144
 QY 147 AMDTDGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGPRTY 206
 Db 145 GOKAILFLPMSAKS 158
 QY 207 GOKAILFLPLVSS 220

RESULT 9
 FGF2 SHEEP STANDARD; PRT; 155 AA.
 AC P20003;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2 OR FGF-2.
 OS Ovis aries (Sheep).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
 OC Bovidae; Caprinae; Ovis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RA Sutton R., Ward W.G., Raphael K.A., Cam G.R.;
 RL Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.
 RN [2]
 RP SEQUENCE OF 9-155.
 RX MEDLINE; 88055577.
 RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.;
 RA Rubira M.R., Burgess A.W.;
 RT "Primary structure of ovine pituitary basic fibroblast growth factor.";
 RL FEBS Lett. 224:128-132(1987).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC EMBL; L36136; AAA31519.1;
 DR PIR; S00185; S00185.
 DR HSSP; P09038; IBFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGF.FGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).
 FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).
 FT BINDING 27 31 HEPARIN (POTENTIAL).
 FT BINDING 116 119 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;

Query Match 32.4%; Score 516; DB 1; Length 155;

Best Local Similarity 55.2%; Pred. No. 6.64e-93;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 24 GHEKDKRLCKNGGFLRLHPDGRVGVREKSDPHIKLOLAEEERGVSIGVCANRYL 83
QY 87 ANYKKPLKLYCSNGGHEFLRLPDGTVDGTRSDQHLQLSAESVGEVYIKSTETCOYL 146
Db 84 AMKEDGRLLASKVTDCEFFERLESNNYTYRSKYS--SWYVALKRTQYKLGPKTGP 141
QY 147 AMDTDGLLYGSQTNBECLEFLERLEENHYNTYISKHAENWFGVLAKNGSKRGPRTHY 206
Db 142 GOKAILEFLPMSAKS 155
QY 207 GOKAILEFLPVS 220

RESULT 10
ID FGF2_BOVIN STANDARD; PRT; 155 AA.
AC P03969;
23-OCT-1986 (Rel. 02, Created)
23-OCT-1986 (Rel. 02, Last sequence update)
01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN) [CONTAINS: KIDNEY-DERIVED GROWTH
DE FACTOR].
GN FGF2 OR FGF-2.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidae;
OC Bovidae; Bovinae; Bos.
[1]
RN RN
SEQUENCE FROM N.A.
RX MEDLINE; 86261806.
RA Abraham J.A., Whang J.L., Tumolo A., Fiddes J.C.;
RA Herrild K.A., Gospodarowicz D., Fiddes J.C.;
RT "Nucleotide sequence of a bovine clone encoding the angiogenic
RT protein, basic fibroblast growth factor.";
RL Science 233:545-548(1986).
RN [2]
RN RN
SEQUENCE FROM N.A.
RX MEDLINE; 87217066.
RA Abraham J.A., Whang J.L., Tumolo A., Fiddes J.C.;
RA "Human basic fibroblast growth factor: nucleotide sequence, genomic
RT organization, and expression in mammalian cells.";
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
RN [3]
RN RN
SEQUENCE OF 10-155.
RX MEDLINE; 86016731.
RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,
RA Gospodarowicz D., Boehlen P., Guillemin R.;
RT "Primary structure of bovine pituitary basic fibroblast growth factor
RT (FGF) and comparison with the amino-terminal sequence of bovine brain
RT acidic FGF.";
RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).
RN [4]
RN RN
SEQUENCE OF 1-9.
RX MEDLINE; 86295737.
RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;
RT "Isolation of an amino terminal extended form of basic fibroblast
RT growth factor.";
RL Biochem. Biophys. Res. Commun. 138:580-588(1986).
RN [5]
RN RN
SEQUENCE OF 25-41.
RX TISSUE-KIDNEY;
RX MEDLINE; 86095426.
RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;
RT "Isolation and partial characterization of an endothelial cell growth
RT factor from the bovine kidney: homology with basic fibroblast growth
RT factor.";
RL Regul. Pept. 12:201-213(1985).
RN [6]
RN RN
SEQUENCE OF 21-40.
RX TISSUE-KIDNEY;

RX MEDLINE; 87119165.
RA Ueno N., Baird A., Esch F., Shimasaki S., Ling N., Guillemin R.;
RT "Purification and partial characterization of a mitogenic factor from
RT bovine liver: structural homology with basic fibroblast growth
RT factor.";
RL Regul. Pept. 16:135-145(1986).
RN [7]
RN RN
X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
RX MEDLINE; 91095983.
RA Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,
RA Hsu B.T., Rees D.C.;
RT "Three-dimensional structures of acidic and basic fibroblast growth
RT factors.";
RL Science 251:90-93(1991).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL; M13440; AAA30518.1;
DR PIR; A24663; GKBOB.
DR PIR; A24819; A24819.
DR PIR; A32878; A32878.
DR PDB; 1BAS; 31-OCT-93.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00263; IL1HBGF.
DR PRINTS; PR00263; HBGFEGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding;
3D-structure.
FT PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
FT STRAND 30 34
FT TURN 35 38
FT STRAND 39 43
FT TURN 45 46
FT STRAND 49 52
FT TURN 55 56
FT TURN 58 60
FT HELIX 62 68
FT STRAND 69 70
FT TURN 71 76
FT TURN 77 80
FT STRAND 81 85
FT TURN 87 88
FT STRAND 91 94
FT HELIX 99 101
FT STRAND 103 107
FT TURN 109 110
FT STRAND 113 117
FT TURN 121 122
FT STRAND 124 124
FT TURN 127 127
FT TURN 129 130
FT STRAND 133 133
FT HELIX 136 138

FT TURN 141 142
FT HELIX 144 146
FT STRAND 148 151
SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;
Query Match 32.4%; Score 516; DB 1; Length 155;
Best Local Similarity 55.2%; Pred. No. 6.64e-93;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 24 GHFKDPRKLYCKNGGFLRLHPDGRVDGVRKSPDKIKLQLOAERGVSIVKGCANRYL 83
QY 87 ANYKPKLLYCSNGGHEFLRLPDGTVDGRSDQHILQLSABSGVEVIKSTETQOYL 146
Db 84 AKKEDGRLKASKVCTDECFEERLESNNYTYRSRKYK--SWYVALRGTQYKLGPKTGP 141
QY 147 AMDTDGLYSGTNEBCLFLERLEENHYNTYISKHAEKNWFVGLAKNGSKRGPRTHY 206
Db 142 GQKAILFLPMSAKS 155
207 GQKAILFLPLPVSS 220
RESULT 11
ID FGF2_HUMAN STANDARD; PRT; 155 AA.
AC P09038;
DT 01-NOV-1988 (Rel. 09, Created)
DT 01-NOV-1988 (Rel. 09, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATINOPIN).
GN FGF2 OR FGF8.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87053817.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,
RA Gospodarowicz D., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence and
RT genomic organization.";
RL EMBO J. 5:2523-2528(1986).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87217066.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence, genomic
RT organization, and expression in mammalian cells.";
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
RN [3]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87213238.
RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,
RA Rifkin D.B.;
RT "A form of human basic fibroblast growth factor with an extended
RT amino terminus.";
RL Biochem. Biophys. Res. Commun. 144:543-550(1987).
RN [4]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87162468.
RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;
RT "Cloning and expression of cDNA encoding human basic fibroblast
RT growth factor.";
RL FEBS Lett. 213:189-194(1987).
RN [5]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89184522.
RA Pratts H., Kaghed M., Pratts A.C., Klagsbrun M., Lelias J.M.,
RA Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,
RA Caput D.;
RT "High molecular mass forms of basic fibroblast growth factor are
RT initiated by alternative CUG codons.";
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).

RN [6]
RX SEQUENCE OF 10-35.
RX MEDLINE; 86275260.
RA Gautschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
RL human brain: acidic and basic fibroblast growth factors.";
RN FEBS Lett. 204:203-207(1986).
RP SEQUENCE OF 10-39.
RX MEDLINE; 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
RT amino terminal sequences and specific mitogenic activities.";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
RN [8]
RP SEQUENCE OF 2-22.
RX MEDLINE; 87156886.
RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;
RT "Amino-terminal sequence of a large form of basic fibroblast growth
RT factor isolated from human benign prostatic hyperplastic tissue.";
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).
RN [9]
RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
RX MEDLINE; 91195367.
RA Eriksson A.E., Cousins L.S., Weaver L.H., Matthews B.W.;
RT "Three-dimensional structure of human basic fibroblast growth
RT factor.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).
RN [10]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 94004464.
RA Eriksson A.E., Cousins L.S., Matthews B.W.;
RT "Refinement of the structure of human basic fibroblast growth factor
RT at 1.6-A resolution and analysis of presumed heparin binding sites by
RT selenate substitution.";
RL Protein Sci. 2:1274-1284(1993).
RN [11]
RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).
RX MEDLINE; 91195368.
RA Zhang J., Cousins L.S., Barr P.J., Sprang S.R.;
RT "Three-dimensional structure of human basic fibroblast growth factor,
RT a structural homolog of interleukin 1 beta.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).
RN [12]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 92121151.
RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;
RT "Crystal structure of basic fibroblast growth factor at 1.6-A
RT resolution.";
RL J. Biochem. 110:360-363(1991).
RN [13]
RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).
RX MEDLINE; 91095983.
RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
RA Hsu B.T., Rees D.C.;
RT "Three-dimensional structures of acidic and basic fibroblast growth
RT factors.";
RL Science 251:90-93(1991).
RN [14]
RP STRUCTURE BY NMR.
RX MEDLINE; 97040521.
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;
RT "High-resolution solution structure of basic fibroblast growth factor
RT determined by multidimensional heteronuclear magnetic resonance
RT spectroscopy.";
RL Biochemistry 35:13552-13561(1996).
RN [15]
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VIRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.

CC CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----

CC EMBL; M17599; AAA52534.1; ALT_INIT.
CC EMBL; X04431; CAA28027.1; -
CC EMBL; X04432; CAA28028.1; -
CC EMBL; X04433; CAA28029.1; -
CC EMBL; M27968; AAA52448.1; -
CC EMBL; J04513; AAA52533.1; ALT_INIT.
CC PIR; A25824; A25824.
CC PIR; A26642; A26642.
CC PIR; B24243; B24243.
CC PIR; B24301; B24301.
CC PIR; B32878; B32878.
CC PIR; S00297; S00297.
CC PDB; 2FGF; 15-APR-92.
CC PDB; 4FGF; 15-JUL-93.
CC PDB; 1FGF; 15-JUL-93.
CC PDB; 1BFB; 03-APR-96.
CC PDB; 1BFC; 03-APR-96.
CC PDB; 1BFF; 16-JUN-97.
CC PDB; 2BFG; 31-JAN-94.
CC PDB; 2BFH; 30-APR-94.
CC PDB; 1BLA; 08-NOV-96.
CC PDB; 1BLD; 08-NOV-96.
CC MIM; 134920; -
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; ILIHGFG.
CC PRINTS; PR00263; HBGFFGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
CC Growth factor; Mitogen; Vascularization; Heparin-binding;
CC 3D-structure.
CC PROPEP 1 9
CC CHAIN 10 155
CC SITE 46 48
CC SITE 88 90
CC BINDING 27 31
CC BINDING 116 119
CC STRAND 30 34
CC TURN 35 38
CC TURN 39 43
CC TURN 45 46
CC TURN 49 52
CC TURN 55 56
CC TURN 58 60
CC STRAND 62 66
CC TURN 69 70
CC STRAND 71 76
CC TURN 77 80
CC TURN 81 85
CC TURN 87 88
CC STRAND 91 94
CC HELIX 99 101
CC STRAND 103 107
CC TURN 109 110
CC STRAND 113 117
CC TURN 121 122
CC STRAND 124 124
CC TURN 127 127
CC TURN 129 130
CC STRAND 132 133
CC TURN 136 138
CC HELIX 141 142
CC TURN 144 146
CC STRAND 148 152
CC SEQUENCE 155 AA; 17254 MW; BE5CEI3373007129 CRC64;

HEPARIN-BINDING GROWTH FACTOR 2.
CELL ATTACHMENT SITE (POTENTIAL).
CELL ATTACHMENT SITE (POTENTIAL).
HEPARIN (POTENTIAL).
HEPARIN (POTENTIAL).

Query Match 32.0%; Score 509; DB 1; Length 155;
Best Local Similarity 54.5%; Pred. No. 3.28e-91;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
DB 24 GHFKDKRYKCKNGFFLRHPDGRVDRGKSDPHIKLQAEERGVSIGVCANRYL 83
:::|||||:::|||||:::|||||:::|||||:::|||||:::|||||:::|||||
QY 87 ANYKKKLLYCSNGHFLRLPDGTVDGFRDSQHIQLQLSAESVGEVYIKSTETGQYL 146
DB 84 AMKEDGLRLASKCVTDECFFERLESNNYNTYRSRYT--SWYVALKRTGQYKLGSKTGP 141
|||:::|||||:::|||||:::|||||:::|||||:::|||||:::|||||
QY 147 AMDTDGLLYGSQTPNEECLEFLERLEENHYNTYISKHAENKWFGLKNGSKCRGRPTHY 206
DB 142 GKAILFLPMSAKS 155
QY 207 GKAILFLPLPVSS 220
|||||:::|

RESULT 12

ID FGF2_RAT STANDARD; PRT; 154 AA.
AC F13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=OVARY;
RX MEDLINE; 89061721.
RA Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RT "Complementary DNA cloning and sequencing of rat ovarian basic
RT fibroblast growth factor and tissue distribution study of its mRNA.";
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RC TISSUE=BRIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
RL Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
RT "Cloning of the rat fibroblast growth factor-2 promoter region and
RT its response to mitogenic stimuli in glioma C6 cells.";
RL J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=BRIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
RT "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
RT mRNA containing a unique 3' untranslated region.";
RL Biochim. Biophys. Acta 1131:314-316(1992).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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 CC -----

DR EMBL; M22427; AAA41210.1; -
 DR EMBL; X07285; AAC30265.1; -
 DR EMBL; U78079; AAC53225.1; -
 DR EMBL; X61697; CAA43863.1; -
 DR PIR; S00876; S00876.
 DR PIR; A31674; A31674.
 DR HSP; P09038; 1BFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGF.FGF.
 DR PROSITE; PS00247; HBGF.FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
 BINDING 26 30 HEPARIN (POTENTIAL).
 FT BINDING 115 118 HEPARIN (POTENTIAL).
 SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match 31.9%; Score 508; DB 1; Length 154;
 Best Local Similarity 54.5%; Pred. No. 5.73e-91;
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

DB 23 GHFKDPRLLCKNGGFFLRHPDGRVDGVRKSDPHVKLQLOAERGVSIGKVCANRYL 82
 QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHLQLSAESVGEVYIKSTETGQYL 146
 DB 83 AMKEDGRLLASKCVTECEFFERLESNNYNTYRSKYS--SWYVALKRTGYKLGSKTGP 140
 QY 147 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAERNWFVGLAKNGSKRGPRTHY 206
 DB 141 GKAILFLPMSAKS 154
 QY 207 GKAILFLPVS 220

RESULT 13
 ID FGF2_MOUSE STANDARD; PRT; 154 AA.
 AC PL5655;
 DT 01-APR-1990 (Rel. 14, Created)
 DT 01-APR-1990 (Rel. 14, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2 OR FGF-2.
 OS Mus musculus (Mouse).
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 90201563.
 RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
 RT "Isolation of cDNAs encoding four mouse fcr family members and
 RT characterization of their expression patterns during embryogenesis.";
 RL Dev. Biol. 138:454-463(1990).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.

CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----

DR EMBL; M30644; AAA37621.1; -
 DR PIR; C37360; C37360.
 DR HSP; P09038; 1BFF.
 DR MGD; MGI:95516; FGF2.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGF.FGF.
 DR PROSITE; PS00247; HBGF.FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
 BINDING 26 30 HEPARIN (POTENTIAL).
 FT BINDING 115 118 HEPARIN (POTENTIAL).
 SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

Query Match 31.9%; Score 508; DB 1; Length 154;
 Best Local Similarity 54.5%; Pred. No. 5.73e-91;
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
 DB 23 GHFKDPRLLCKNGGFFLRHPDGRVDGVRKSDPHVKLQLOAERGVSIGKVCANRYL 82
 QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHLQLSAESVGEVYIKSTETGQYL 146
 DB 83 AMKEDGRLLASKCVTECEFFERLESNNYNTYRSKYS--SWYVALKRTGYKLGSKTGP 140
 QY 147 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAERNWFVGLAKNGSKRGPRTHY 206
 DB 141 GKAILFLPMSAKS 154
 QY 207 GKAILFLPVS 220

RESULT 14
 ID FGF2_MONDO STANDARD; PRT; 156 AA.
 AC P48798;
 DT 01-FEB-1996 (Rel. 33, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2.
 OS Monodelphis domestica (Short-tailed grey opossum).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-EYE;
 RX MEDLINE; 94296558.
 RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;
 RT "Characterization of cDNA encoding basic fibroblast growth factor of
 RT the marsupial Monodelphis domestica.";
 RL DNA Cell Biol. 13:549-554(1994).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----

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CC EMBL; Z15154; CAA78854.1; ALT_INIT.
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHGFG.
DR PROSITE; PS00263; HBGF-FGF.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 155
FT BINDING 27 31
FT BINDING 116 119
FT BINDING 111 111
FT CONFLICT 111 111
FT MISSING (IN REF. 2).
SQ SEQUENCE 155 AA; 17303 MW; 7E653FCCA49BF1209 CRC64;

Query Match 31.3%; Score 498; DB 1; Length 155;
Best Local Similarity 54.5%; Pred. No. 1.49e-88;
Matches 73; Conservative 28; Mismatches 37; Indels 2; Gaps 1;

25 GHFKDPKRLKCKNGGFFLRHDPGRVDGIRKSDPNIKLQQAERGVVSIKGVCANRYL 84
::: || || || || || || || || || || || || || || || || || || || ||
87 ANYKPKLLKLYCSNGGHFLRILPDGTVGTRDSQHIQLQLSAESVGEVIKSTETGQYL 146
::: || || || || || || || || || || || || || || || || || || || ||
85 AMKEDGRLLKLYVTEGFFERLESNNYNYRSKYS--NWYVALKRTGQYKLGSKTGP 142
|| || || || || || || || || || || || || || || || || || || || ||
147 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206
|| || || || || || || || || || || || || || || || || || || || ||
143 GOKAILFLPMSAKS 156
|||||||::: |
QY 207 GOKAILFLPLPVSS 220

RESULT 15
ID FGF2_XENLA STANDARD; PRT; 155 AA.
AC P12226.
DT 01-OCT-1989 (Rel. 12, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF).
GN FGF2 OR FGF-2.
OS Xenopus laevis (African clawed frog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidea; Pipidae;
OC Xenopodinae; Xenopus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89056621.
RA Kimeiman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;
RA "The presence of fibroblast growth factor in the frog egg: its role
RA as a natural mesoderm inducer.";
RL Science 242:1053-1056(1988).
RN [2]
RP SEQUENCE OF 95-155 FROM N.A.
RX MEDLINE; 88052890.
RA Kimeiman D., Kirschner M.;
RA "Synergistic induction of mesoderm by FGF and TGF-beta and the
RT identification of an mRNA coding for FGF in the early Xenopus
RT embryo.";
RL Cell 51:869-877(1987).
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; M18067; AAA49726.1; -
DR FIR; A29618; A29618.
DR FIR; A40117; A40117.
DR HSSP; P09038; 1BFF.
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DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHGFG.
DR PROSITE; PS00263; HBGF-FGF.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 155
FT BINDING 27 31
FT BINDING 116 119
FT BINDING 111 111
FT CONFLICT 111 111
FT MISSING (IN REF. 2).
SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 30.7%; Score 489; DB 1; Length 155;
Best Local Similarity 53.0%; Pred. No. 2.21e-86;
Matches 71; Conservative 24; Mismatches 37; Indels 2; Gaps 1;

24 GSFKDPKRLKCKNGGFFLRINSRVDGSRDSDSHKILQQAVERGVVSIKGTANRYL 83
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87 ANYKPKLLKLYCSNGGHFLRILPDGTVGTRDSQHIQLQLSAESVGEVIKSTETGQYL 146
::: || || || || || || || || || || || || || || || || || || || ||
84 AMKEDGRLLKLYVTEGFFERLESNNYNYRSKYS--SWYVALKRTGQYKKNKSGTGP 141
|| || || || || || || || || || || || || || || || || || || || ||
147 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206
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142 GOKAILFLPMSAKS 155
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207 GOKAILFLPLPVSS 220
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Job time : 13 secs.

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Description: (1-221) from US09121017B.peg
Perfect Score: 1593
Sequence: 1 MAPARLFALLLFVGVGVAES.....

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Scoring table: PAM 150
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: ~~spirembill2~~

1:sp_archea 2:sp_bacteria 3:sp_fungi 4:sp_human
5:sp_invertebrate 6:sp_mammal 7:sp_mhc 8:sp_organelle
9:sp_phage 10:sp_plant 11:sp_rodent 12:sp_unclassified
13:sp_vertebrate 14:sp_virus

Statistics: Mean 44.785; Variance 70.998; scale 0.631

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Result No.	Score	Query		Length	DB	ID	Description	Pred. No.
		Match						
1	511	32.1	130	6	07767	BASIC FIBROBLAST GROWTH	2.28e-95	
2	509	32.0	196	4	P78443	21 KD BASIC FIBROBLAST	7.23e-95	
3	382	28.0	101	13	P79706	BASIC FGF (FRAGMENT).	1.85e-63	
4	359	22.5	198	11	O35988	RYUDOCAN CORE PROTEIN	9.87e-58	
5	346	21.7	146	13	Q07659	FIBROBLAST GROWTH FACT	9.21e-55	
6	313	19.6	115	11	O60487	BASIC FIBROBLAST GROWTH	6.68e-47	
7	302	19.0	194	6	P79150	KERATINOCYTE GROWTH FA	2.62e-44	
8	301	18.9	212	13	O42407	FIBROBLAST GROWTH FACT	4.49e-44	
9	274	17.2	252	11	O89096	FFH-4B.	8.79e-38	
10	270	16.9	70	11	O54837	FIBROBLAST GROWTH FACT	7.36e-37	
11	264	16.6	59	4	O16089	ACIDIC FIBROBLAST GROW	1.76e-35	
12	265	16.6	60	4	O16588	ACIDIC FIBROBLAST GROW	1.04e-35	
13	260	16.3	196	13	Q9YH31	PUTATIVE FIBROBLAST GR	1.46e-34	
14	257	16.1	243	13	Q9W6A1	FIBROBLAST GROWTH FACT	7.05e-34	
15	251	15.8	127	4	Q99517	FIBROBLAST GROWTH FACT	1.64e-32	
16	250	15.7	206	13	Q9YGB8	FIBROBLAST GROWTH FACT	2.76e-32	
17	248	15.6	192	4	O95830	FIBROBLAST GROWTH FACT	7.86e-32	
18	248	15.6	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	7.86e-32	
19	236	14.8	200	13	P79925	FIBROBLAST GROWTH FACT	3.98e-29	
20	226	14.2	425	5	O76831	LET-756 PROTEIN.	6.79e-27	

P78443;
AC 01-MAY-1997 (TREMBlrel. 03, Created)
DT 01-MAY-1997 (TREMBlrel. 03, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE 21 KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).
GN FGF2.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Homidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89184522.
RA PRATS H., KAGHAD M., PRATS A.C., KLAGSBRUN M., LELIAS J.M.,
RA LAUZUN P., CHALON P., TAUBER J.P., AMALRIC F., SMITH J.A., CAPUT D.;
RA "High molecular mass forms of basic fibroblast growth factor are
RT initiated by alternative CUG codons.";
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
RN [2]
RP SEQUENCE OF 81-168 FROM N.A.
RX MEDLINE; 93038590.
RA WATSON R., ANTHONY F., PICKETT M., LAMBEN P., MASSON G.M.,
RA THOMAS E.J.;
RA "Reverse transcription with nested polymerase chain reaction shows
RT expression of basic fibroblast growth factor transcripts in human
RT granulosa and cumulus cells from in vitro fertilisation patients.";
RL Biochem. Biophys. Res. Commun. 187:1227-1231(1992).
DR EMBL; J04513; AA52532.1; -;
DR EMBL; S47380; AAD13053.1; -;
DR HSSP; P09038; 1BFF.
DR PROSITE; PS00247; HBG_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBG_FGF.
SQ SEQUENCE 196 AA; 21203 MW; 49B75E39 CRC32;
Query Match 32.0%; Score 509; DB 4; Length 196;
Best Local Similarity 54.5%; Pred. No. 7.23e-95;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 65 GHFDPKRLKCYKNGGFFRIHPDGVGVKRESDPHIKLOQAERGVSIGVCANRYL 124
QY 87 ANYKPKLLKCYKNGGFFRIHPDGVGVKRESDPHIKLOQAERGVSIGVCANRYL 146
Db 125 AMKEDGRLLAKCVGDFEFLERLESNNYTRSKYT--SWYALKRTGYKLGSKTGP 182
QY 147 AMDTGLYGSOTPNECLFLERLEENHNYIISKHAENKWFVGLKNGSKRGPRTHY 206
Db 183 GOKAILFLPM SAKS 196
207 GOKAILFLPLPVSS 220
RESULT 3
ID P79706 PRELIMINARY; PRT; 101 AA.
AC P79706;
DT 01-MAY-1997 (TREMBlrel. 03, Created)
DT 01-MAY-1997 (TREMBlrel. 03, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE BASIC FGF (FRAGMENT).
OS Cynops pyrrhogaster (Japanese common newt).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.
RN [1]
RP SEQUENCE FROM N.A.
RX TISSUE-EMBRYO;
RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
RA KANEDA T.;
RA "Serial expression of the genes in a mesodermalizing ectoderms of
RT early Cynops gastrula.";
RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; D89443; BAAL3958.1; -;
DR HSSP; P09038; 2BFF.
DR PROSITE; PS00247; HBG_FGF; 1.

DR PFAM; PF00167; FGF; 1.
FT NON_TER 1 1
SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;
Query Match 24.0%; Score 382; DB 13; Length 101;
Best Local Similarity 53.4%; Pred. No. 1.85e-63;
Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;
Db 1 PKRLYKNGGFFRLINSKGVDGAREKSDSYIKLOQAERGVSIGVCANRYLAMKDD 60
QY 92 PKLYCSNGGHFLRIPLDGTVDGRSDQHIQLQSAESVGEVYIKSTGTGYLAMDT 151
Db 61 GRMLAKWITDECFERLESNNYTRSKYSD--WYVALKR 101
QY 152 GLLYGSOTPNECLFLERLEENHNYIISKHAENKWFVGLKK 194
RESULT 4
ID Q35988 PRELIMINARY; PRT; 198 AA.
AC Q35988;
DT 01-JAN-1998 (TREMBlrel. 05, Created)
DT 01-JAN-1998 (TREMBlrel. 05, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE RYUDOCAN CORE PROTEIN PRECURSOR.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX STRAIN=C3H/AN, AND 129SVJ;
RX MEDLINE; 97420681.
RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;
RT "Molecular cloning, genomic organization, promoter activity, and
RT tissue-specific expression of the mouse ryudocan gene.";
RL J. Biochem. 122:17-24(1997).
CC -I- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN
CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO
CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.
DR EMBL; D89571; BAA22135.1; -;
DR EMBL; D89572; BAA22136.1; -;
DR PROSITE; PS00964; SYNDSCAN; 1.
DR PFAM; PF01034; Syndecan; 1.
KW Signal; Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein.
FT SIGNAL 1 23 POTENTIAL.
FT CHAIN 24 198 POTENTIAL.
SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;
Query Match 22.5%; Score 359; DB 11; Length 198;
Best Local Similarity 72.0%; Pred. No. 6.87e-58;
Matches 67; Conservative 9; Mismatches 8; Indels 9; Gaps 6;
Db 1 MAPACLLAPLLLLGGFPLVPGESIRETEVIDPQDLLEGYSFSGALPDDEDA-G-G--S 56
QY 1 MAPARLFA-LLLFVGG--VA-ESIRETEVIDPQDLLEGYSFSGALPDDEVDVVGQES 55
Db 57 DDFELSGDLDDETEPRPEVIEPLVPLDNH 89
QY 56 DDFELSGDLDDEDSNIGVEVHVPLVPLDAN 88
RESULT 5
ID Q07659 PRELIMINARY; PRT; 146 AA.
AC Q07659;
DT 01-NOV-1996 (TREMBlrel. 01, Created)
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR.
GN BFGF.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]

[illegible]

QY 139 STETQYLAAMDTDGLYSGQTPNECLFLERLEENHYNTIS-K-KHAEKNFVGLKNG 196
Db 189 ATKRCQKTRKNTSAHFLPMVMS 212
QY 197 SCKGRPRTHYGOKAILFLPLVSS 220

RESULT 9
ID O89096 PRELIMINARY; PRT; 252 AA.
AC O89096;
DT 01-NOV-1998 (TREMELrel. 08, Created)
DT 01-NOV-1998 (TREMELrel. 08, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE FHF-4B
OS Rattus norvegicus (Rat), and Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE: 98267141.
RA TISSUE-BRAIN:
RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;
RT "Structure and expression of a novel isoform of mouse FGF homologous
RT factor (FHF)-4.";
RL Biochim. Biophys. Acta 1398:38-41(1998).
DR EMBL: AB008908; BAA31544.1; -
DR EMBL: AB008907; BAA31543.1; -
DR HSP: P03968; IBAR.
DR PROSITE: PS00247; HBGF_FGF; 1.
DR PFAM: PF00167; FGF; 1.
SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match 17.2%; Score 274; DB 11; Length 252;
Best Local Similarity 37.5%; Pred. No. 8.79e-38;
Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;
Db 80 LYCROG-YLQMPHGALDGTDDNSTLFLNLPVGLRVVAIQGVKTLGIAMNGEYL 138
QY 95 LYCSNGHFLRLPDGTVGTRDRSDQHQLQLSAESVEGYIKSTETGQYLAAMDTDGLL 154
Db 139 YPSELTPECKPKESVFENYVYISMLYRQESGRANFLGNKEGQVMKGNRVKTKPA 198
QY 155 YGSQTPNECLFLERLEENHYNTISK--KHAE--KNFVGLKNGSCKGRPRTHYGOKA 210
Db 199 AHFLPKPL 206
QY 211 ILFLPLV 218

RESULT 10
ID O54837 PRELIMINARY; PRT; 70 AA.
AC O54837;
DT 01-JUN-1998 (TREMELrel. 06, Created)
DT 01-JUN-1998 (TREMELrel. 06, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.
DR EMBL: AF012926; AAB94020.1; -
DR HSP: P05230; 2AXM.
DR PFAM: PF00167; FGF; 1.
FT NON_TER 70
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;
Query Match 16.9%; Score 270; DB 11; Length 70;
Best Local Similarity 92.5%; Pred. No. 7.36e-37;

Matches 37; Conservative 2; Mismatches 0; Indels 1; Gaps 1;
Db 32 LPL-GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 70
QY 83 VPLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 122
RESULT 11
ID Q16089 PRELIMINARY; PRT; 59 AA.
AC Q16089;
DT 01-NOV-1996 (TREMELrel. 01, Created)
DT 01-NOV-1996 (TREMELrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human)
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Homiidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE: 94069734.
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RL cells.";
RL Transplantation 56:1177-1182(1993).
DR EMBL: S67294; AAB29059.1; -
DR HSP: P05230; 2AXM.
DR PFAM: PF00167; FGF; 1.
FT NON_TER 59
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;
Query Match 16.6%; Score 264; DB 4; Length 59;
Best Local Similarity 97.2%; Pred. No. 1.76e-35;
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 56
QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 122

RESULT 12
ID Q16588 PRELIMINARY; PRT; 60 AA.
AC Q16588;
DT 01-NOV-1996 (TREMELrel. 01, Created)
DT 01-NOV-1996 (TREMELrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Homiidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE: 94069734.
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RL cells.";
RL Transplantation 56:1177-1182(1993).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE: 92202857.
RA LI Y.L., KHA H., GOLDEN J.A., MIGCHIELSEN A.A.J., GOETZL E.J.,
RA TURCK E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist.";
RL J. Exp. Med. 175:1073-1080(1992).
DR EMBL: S67292; AAB29058.1; -
DR EMBL: X65779; CAA46662.1; -
DR HSP: P05230; 2AXM.
DR PFAM: PF00167; FGF; 1.
FT NON_TER 60
SQ SEQUENCE 60 AA; 6697 MW; 6CCC7DFF CRC32;

Query Match 16.6%; Score 265; DB 4; Length 60;
Best Local Similarity 92.1%; Pred. No. 1.04e-35;
Matches 35; Conservative 1; Indels 0; Gaps 0;

Db 21 GNYKKPLLYCSNGHFLRLPDGTVGTRSDQHTD 58
QY 87 ANYKPKLLYCSNGHFLRLPDGTVGTRSDQHTD 124

RESULT 13
ID Q9YH31 PRELIMINARY; PRT; 196 AA.

AC Q9YH31;
DT 01-MAY-1999 (Tremblrel. 10, Created)
DT 01-MAY-1999 (Tremblrel. 10, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.
OS Notophthalmus viridescens (Eastern newt) (Triturus viridescens).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.
[1]

SEQUENCE FROM N.A.
WEI Y.;
RT "Putative Newt Fibroblast Growth Factor-4";
RL Submitted (Oct-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; U76998; AAC98812.1;
DR HSSP; P09038; 1BFF.
DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 16.3%; Score 260; DB 13; Length 196;
Best Local Similarity 34.6%; Pred. No. 1.46e-34;
Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;

Db 71 KRLRLCYNGVIGHLOVLPDGRHGMSES-RYSLLEISPVGVCMFGVQSLFLAM 129
QY 90 KPKLLYCSNGHFLRLPDGTVGTRSDQHTDQIQLSASVGEVYIKSTETGQYILAM 148

Db 130 NSKGRFGSKFSDCKEKLMLPNYAYESWRYPGN--YIALSKNGRAKGNKVSPTM 187
QY 149 DTDGLLYGSQPTNEECLEFLERLEENHYTYISKRAERNFWGLKNGSCRGPRTHYGQ 208

Db 188 TVTHFLP 194
QY 209 KAILFLP 215

RESULT 14
ID Q9W6A1 PRELIMINARY; PRT; 243 AA.

AC Q9W6A1;
DT 01-NOV-1999 (Tremblrel. 12, Created)
DT 01-NOV-1999 (Tremblrel. 12, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 12 ISOFORM A.
GN FGF12.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 99065510.
RA MUNOZ-SANJUAN I.; SIMANDL B.K.; FALLON J.F.; NATHANS J.;
RT "Expression of chicken fibroblast growth factor homologous factor
(FHF)-1 and of differentially spliced isoforms of FHF-2 during
development and involvement of FHF-2 in chicken limb development.";
RL Development 126:409-421(1999).
DR EMBL; AF108754; AAD21575.1;
DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 243 AA; 27455 MW; A9E6E8CD CRC32;

Query Match 16.1%; Score 257; DB 13; Length 243;
Best Local Similarity 34.4%; Pred. No. 7.05e-34;
Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps 3;

Db 77 LF-SQOYFLOMHPDGTIDGTDKSDNSDYTLNLPVGLRVVAIOGVKAGLYVAMNAGEYL 135
QY 95 LYCSNGHFLRLPDGTVGTRSDQHTDQIQLSASVGEVYIKSTETGQYLANDTDGLL 154

Db 136 YSSDVFTPECKFKESVFENYVYSSLYRQOESGRAFWFLGNKEGOIMKGNRVKTKPS 195
QY 155 YGSQTPNEECLEFLERLEENHYTYISK--KHAE--KNMFVGLKNGSKRGPRTHYGOKA 210

Db 196 SHFVPKPI 203
QY 211 ILFLPLP 218

RESULT 15
ID Q99517 PRELIMINARY; PRT; 127 AA.
AC Q99517;
DT 01-MAY-1997 (Tremblrel. 03, Created)
DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).
GN FGF12.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Homnidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RA COULIER F.; PONTAROTTI P.; ROUBIN R.; HARTUNG H.; GOLDFARB M.;
RA BIRNBAUM D.;
RL J. Mol. Evol. 0:0-0(0).
DR EMBL; Z70276; CAA94240.1;
DR HSSP; P03968; 1AFC.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 127
SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 15.8%; Score 251; DB 4; Length 127;
Best Local Similarity 34.6%; Pred. No. 1.64e-32;
Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps 3;

Db 2 LF-SQOYFLOMHPDGTIDGTDKSDNSDYTLNLPVGLRVVAIOGVKAGLYVAMNAGEYL 60
QY 95 LYCSNGHFLRLPDGTVGTRSDQHTDQIQLSASVGEVYIKSTETGQYLANDTDGLL 154

Db 61 YSSDVFTPECKFKESVFENYVYSSLYRQOESGRAFWFLGNKEGOIMKGNRVKTKPS 120
QY 155 YGSQTPNEECLEFLERLEENHYTYISK--KHAE--KNMFVGLKNGSKRGPRTHYGOKA 210

Db 121 SHFVPKP 127
QY 211 ILFLPLP 217

Search completed: Tue Aug 29 15:39:15 2000
Job time : 61 secs.

Db 129 GSKRGPRTHYGOKAILFLPLPVSSD 154
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 2

ID W75414 standard; protein; 154 AA.
 AC W75414:
 DT 02-MAR-1999 (first entry)
 DE Human beta-endothelial cell growth factor.
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
 KW Hybridisation; bovine; wound healing; prosthetic device.
 OS Homo sapiens.
 PN US5827826-A.
 PD 27-OCT-1998. 743261.
 PF 04-NOV-1996; US-743261.
 PR 04-NOV-1996; US-743261.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 WPI: 98-594032/50.
 DT Compositions for promoting wound healing - containing endothelial
 PT cell growth factor polypeptides
 PS Claim 1; Column 16; 23pp; English.
 CC This sequence represents the amino acid sequence of the mature human
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
 CC is identical to the alpha-ECGF but the beta sequence contains an extra
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain
 CC stem cell cDNA library using a probe designed based on fragments of the
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
 CC compositions for promoting wound healing. ECGF is also used to grow
 CC cells on a prosthetic device.
 SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESVGEV 68
 QY 55 SDDFELSGSGDANYKKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESVGEV 114
 Db 69 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 128
 QY 115 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 174
 Db 129 GSKRGPRTHYGOKAILFLPLPVSSD 154
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 3

ID W06816 standard; protein; 154 AA.
 AC W06816:
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor-beta.
 KW Endothelial cell growth factor-beta; ECGF-beta.
 OS Homo sapiens.
 PN US5571790-A.
 PD 05-NOV-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.

PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI: 96-505421/50.
 DR N-PSDB: T45983.
 PT Recombinant human endothelial cell growth factors - for treating
 PT damaged blood vessels, etc.
 PS Claim 1; Column 16; 22pp; English.
 CC Human recombinant endothelial cell growth factors (ECGF) beta
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
 CC They can be produced in transformed prokaryotic or eukaryotic host
 CC cells using DNA sequences (T45983 and T45984, respectively) derived
 CC from the complete human ECGF cDNA (T45985). Large quantities of
 CC the ECGFs are produced by culturing the host cells and recovering
 CC the proteins. ECGFs have utility in the growth and amplification
 CC of endothelial cells in culture. They can potentially be used to
 CC treat damaged blood vessels and other endothelial cell-lined
 CC structures, and also have diagnostic applns.
 SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESVGEV 68
 QY 55 SDDFELSGSGDANYKKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESVGEV 114
 Db 69 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 128
 QY 115 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 174
 Db 129 GSKRGPRTHYGOKAILFLPLPVSSD 154
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 4

ID W04805 standard; Protein; 154 AA.
 AC W04805:
 DT 29-DEC-1996 (first entry)
 DE Human beta-endothelial cell growth factor.
 KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
 KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
 OS Homo sapiens.
 PN US5552528-A.
 PD 03-SEP-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Maciag T;
 DR WPI: 96-412132/41.
 DR N-PSDB: T37503.
 PT Isolated, purified, biologically active bovine beta endothelial cell
 PT growth factor - useful to regenerate or treat damaged blood vessels
 PS Disclosure; Fig 8; 28pp; English.
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
 CC brain using heparin-Sepharose affinity chromatography. ECGF is
 CC useful for among other purposes, diagnostic applications and has
 CC potential in the treatment of damaged blood vessels or other
 CC endothelial cell-lined structures.
 CC Human ECGF (T37503) or fragments may be obtained using
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
 CC on the sequence of bovine alpha- and beta-ECGF.
 SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 130 GSCKRGPRTHYGQKAILFLPLPVSSD 155

Db	13	TEKFNLPG- NYKPKLLY CSNGGHF RIILPDGTV DRDRSD QHQLQL SAESVGEV	69
Qy	55	SDFELSGSGDAN YKPKLLY CSNGGHF RIILPDGTV DRDRSD QHQLQL SAESVGEV	114
Db	70	YIKSTGTQY LANDTG LLYGSQT NNEEC FLERLEENH NYTISKKA ENK NWFWGL LKN	129
Qy	115	YIKSTGTQY LANDTG LLYGSQT NNEEC FLERLEENH NYTISKKA ENK NWFWGL LKN	174
Db	130	GSCKRGPRTHY GQKAILFL PLPVSSD	155
Qy	175	GSCKRGPRTHY GQKAILFL PLPVSSD	200

RESULT 10
 ID W53022 standard; Protein; 155 AA.
 AC W53022;
 ID 14-AUG-1998 (first entry)
 DE Fibroblast growth factor protein 1.
 DE FGF; cell growth; survival; differentiation; central nervous system;
 DE peripheral nervous tissue; treatment; diagnosis; cell culture.
 DE Mammalian.
 PN W09808864-A1.
 PD 05-MAR-1998.
 PF 27-AUG-1997; U15237.
 PR 30-AUG-1996; US-705245.
 PR (UYJO) UNIV JOHNS HOPKINS SCHOOL MEDICINE.
 PI Nathans J, Smallwood PM;
 PI WPI: 98-179380/16.
 DR PT New fibroblast growth factor homologous factors - useful for, e.g.
 PT developing products for diagnosis and treatment of conditions
 PT involving neuro-degenerative and neoplastic disorders
 PT Disclosure; Page 50-51; 94pp; English.
 PS CC Fibroblast growth factor (FGF) proteins (W53022-W53024 and W53029-W53033)
 CC are members of the fibroblast growth factor family and have homology to
 CC fibroblast growth factor homologous factor (FHF) proteins. The FHF
 CC proteins (FHF 1-4) are involved in regulating the growth, survival, and
 CC differentiation of cells in the central nervous system, as well as cells
 CC in peripheral nervous tissues. The proteins can therefore be used for
 CC treating and diagnosing conditions involving the nervous system. FHF's
 CC can also be used in methods for maintaining cultured cells or tissues or
 CC to promote neuron growth in vitro.
 CC Sequence 155 AA;
 SQ

Query Match	68.3%;	Score 985;	DB 1;	Length 155;
Best Local Similarity	93.8%;	Pred. No. 2,04e-86;		
Matches 137;	Conservative 5;	Mismatches 1;	Indels 3;	Gaps 2;

Db	13	TEKFNLPG- NYKPKLLY CSNGGHF RIILPDGTV DRDRSD QHQLQL SAESVGEV	69
Qy	55	SDFELSGSGDAN YKPKLLY CSNGGHF RIILPDGTV DRDRSD QHQLQL SAESVGEV	114
Db	70	YIKSTGTQY LANDTG LLYGSQT NNEEC FLERLEENH NYTISKKA ENK NWFWGL LKN	129
Qy	115	YIKSTGTQY LANDTG LLYGSQT NNEEC FLERLEENH NYTISKKA ENK NWFWGL LKN	174
Db	130	GSCKRGPRTHY GQKAILFL PLPVSSD	155
Qy	175	GSCKRGPRTHY GQKAILFL PLPVSSD	200

RESULT 11
 ID R70812 standard; protein; 155 AA.
 AC R70812;
 DT 01-SEP-1995 (first entry)
 DE FGF-1.
 DE FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
 OS Homo sapiens.
 FH Key
 FT Location/Qualifiers
 FT misc_difference 31
 FT /note= "cys may be replaced by Ser"
 FT misc_difference 132
 FT

CC The invention relates to DNA encoding human endothelial cell growth
 CC factors (ECGF) and plasmids comprising the DNA sequences. The DNA encodes
 CC a cleavable signal peptide and an ECGF, where removal of the signal
 CC peptide yields a mature form of the ECGF, where the ECGF is alpha-ECGF or
 CC beta-ECGF. The DNA is used to produce recombinant ECGF proteins, which
 CC can be used in treatments to repair or regenerate blood vessels or other
 CC structures lined with endothelial cells. The present sequence represents
 CC a human ECGF protein (the encoding cDNA determined from lambda ECGF
 CC clones 1 and 29).
 SQ Sequence 155 AA;

Query Match 68.3%; Score 985; DB 1; Length 155;
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKNLPG--NYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEV 69
 QY ::::: :
 55 SDFELSGSDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEV 114
 QY ::::: :
 70 YIKSTETGOYLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 129
 QY ::::: :
 115 YIKSTETGOYLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 174
 Db 130 GSKRGPRTHYGOKAILFLPLPVSSD 155
 QY ::::: :
 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 13
 ID R05785 standard; Protein; 165 AA.
 AC R05785;
 DT 22-AUG-1990 (first entry)
 DE Human bECGF encoded by synthetic gene.
 KW Beta-endothelial cell growth factor; homeostasis;
 KW atherosclerosis; tumor.
 OS Synthetic.
 FH Key Location/Qualifiers
 FT misc_difference 160..161
 FT /note= "sites corresp. to two stop codons of
 FT the DNA sequence"

PN DB2223497-A.
 PD 11-APR-1990.
 PE 08-AUG-1988; 018777.
 PR 08-AUG-1988; GB-018777.
 PA (BRB) Brit Bio-Tech Ltd.
 PI Davies JA, Johnson ID;
 DR WPI; 90-109883/15.
 DR N-PSDB; Q03871.
 ST Gene encoding human beta-endothelial cell growth factor -
 ST incorporates useful restriction sites at frequent intervals to
 ST facilitate cassette mutagenesis at selected regions.
 PS Disclosure; Fig 3a; 18pp; English.
 CC The synthetic bECGF gene incorporates useful restriction sites at
 CC frequent intervals to facilitate the cassette mutagenesis of
 CC selected regions. Also included are flanking sites to simplify
 CC the incorporation of the gene into any expression system.
 CC bECGF is one of the factors involved in the regulation of
 CC homeostasis of blood vessels acting in part through effects on
 CC endothelial cells. Such factors may also play a role in stages
 CC of atherosclerosis and tumour growth and development.
 SQ Sequence 165 AA;

Query Match 68.3%; Score 985; DB 1; Length 165;
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 17 TEKNLPG--NYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEV 73
 QY ::::: :
 55 SDFELSGSDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEV 114
 Db 74 YIKSTETGOYLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 133
 QY ::::: :
 115 YIKSTETGOYLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 174

Db 134 GSKRGPRTHYGOKAILFLPLPVSSD 159
 QY ::::: :
 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 14
 ID W06818 standard; Protein; 168 AA.
 AC W06818;
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor.
 KW Endothelial cell growth factor; ECGF.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT protein 15..168
 FT /label= ECGF-beta
 FT protein 35..168
 FT /label= ECGF-alpha

PN US5571790-A.
 PD 05-NOV-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 96-505421/50.
 DR N-PSDB; T45985.
 ST Recombinant human endothelial cell growth factors - for treating
 ST damaged blood vessels, etc.
 PS Example D; Fig 8; 22pp; English.
 CC Human endothelial cell growth factor (ECGF) is a mitogen for
 CC endothelial cells. Its amino acid sequence was deduced from a
 CC cDNA clone (T45985) isolated from a human brain stem library.
 CC Recombinant ECGF-beta (W06816) and ECGF-alpha (W06817) can be
 CC produced in transformed host cells. They have utility in the
 CC growth and amplification of endothelial cells in culture, and can
 CC potentially be used to treat damaged blood vessels and other
 CC endothelial cell-lined structures. They also have diagnostic
 CC applns.
 SQ Sequence 168 AA;

Query Match 68.3%; Score 985; DB 1; Length 168;
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 26 TEKNLPG--NYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEV 82
 QY ::::: :
 55 SDFELSGSDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEV 114
 Db 83 YIKSTETGOYLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 142
 QY ::::: :
 115 YIKSTETGOYLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 174
 Db 143 GSKRGPRTHYGOKAILFLPLPVSSD 168
 QY ::::: :
 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 15
 ID W75413 standard; Protein; 134 AA.
 AC W75413;
 DT 02-MAR-1999 (first entry)
 DE Human alpha-endothelial cell growth factor.
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
 KW hybridisation; bovine; wound healing; prosthetic device.
 OS Homo sapiens.
 PN US5827826-A.
 PD 27-OCT-1998.
 PF 04-NOV-1996; 743261.

M P S R C H

(TM)

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MPSrch_pp protein - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 15:52:11 2000; Maspar time 12.09 seconds
780.657 Million cell updates/sec

abular output not generated.

Title: >US-09-121-017B-17-
Description: (1-200) from US09121017B.pep
Perfect Score: 1442
Sequence: 1 MAPARLFAILLFVGVGVAES.....PRTHYGKAILFLPLPVSSD 200

Scoring table: PAM 150
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: p1r54-
1:p1r1 2:p1r2 3:p1r3 4:p1r4

Statistics: Mean 44.238; Variance 77.971; scale 0.567

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES							
Result No.	Score	Query Match	Length DB	ID	Description	Pred. No.	
1	985	68.3	155	1	A33665 acidic fibroblast gro	5.53e-196	
2	967	67.1	155	1	A60721 acidic-fibroblast gro	9.37e-192	
3	966	67.0	155	2	D37360 acidic fibroblast gro	1.66e-191	
4	966	67.0	155	2	S04147 acidic fibroblast gro	1.66e-191	
5	954	66.2	152	1	JH0476 acidic fibroblast gro	1.11e-188	
6	917	63.6	155	1	GRD046 acidic fibroblast gro	5.63e-180	
7	916	63.5	155	2	A60130 acidic fibroblast gro	9.68e-180	
8	906	62.8	155	2	JW0055 fibroblast growth fac	2.16e-177	
9	522	36.2	189	2	A48834 basic fibroblast gro	1.58e-88	
10	516	35.8	146	1	S00185 basic fibroblast gro	3.60e-87	
11	516	35.8	157	1	GRBOB basic fibroblast gro	3.60e-87	
12	509	35.3	210	2	A32398 basic fibroblast gro	1.38e-85	
13	508	35.2	154	2	C37360 basic fibroblast gro	2.32e-85	
14	508	35.2	154	2	A31674 basic fibroblast gro	2.32e-85	
15	498	34.5	164	2	S31622 basic fibroblast gro	4.18e-83	
16	493	34.2	155	1	A40117 basic fibroblast gro	5.60e-82	
17	466	32.3	137	2	I45711 fibroblast growth fac	6.51e-76	
18	455	31.6	198	2	JC1457 ryudocan precursor	1.89e-73	
19	350	24.3	208	2	A48137 fibroblast growth fac	2.60e-50	
20	350	24.3	208	2	S64866 fibroblast growth fac	2.60e-50	
21	329	22.8	207	2	JC5941 fibroblast growth fac	8.82e-46	
22	324	22.5	207	2	JC5940 fibroblast growth fac	1.04e-44	
23	302	20.9	194	2	S49501 keratinocyte growth f	5.11e-40	

24	301	20.9	202	2	A42410 ryudocan precursor	8.32e-40
25	299	20.7	194	1	A36301 fibroblast growth fac	2.21e-39
26	295	20.5	194	2	I48610 keratinocyte growth f	1.55e-38
27	293	20.3	194	2	S26049 fibroblast growth fac	4.08e-38
28	288	20.0	187	2	S23595 embryonic fibroblast	4.62e-37
29	278	19.3	264	2	A36207 transforming protein	5.77e-35
30	275	19.1	192	2	S54407 embryonic Fibroblast	2.44e-34
31	276	19.1	194	2	I50710 fibroblast growth fac	1.51e-34
32	276	19.1	266	2	S68144 fibroblast growth fac	1.51e-34
33	269	18.7	267	1	TVHUF5 transforming protein	4.33e-33
34	268	18.6	198	2	JC5613 ryudocan precursor	6.99e-33
35	266	18.4	60	2	JH0708 fibroblast growth fac	1.82e-32
36	266	18.4	256	2	JC4627 fibroblast growth fac	1.82e-32
37	263	18.2	206	2	JC4268 HST protein - bovine	7.60e-32
38	257	17.8	168	2	JG0184 fibroblast growth fac	1.32e-30
39	255	17.7	206	1	TVHUNS fibroblast growth fac	3.40e-30
40	248	17.2	208	2	S20102 fibroblast growth fac	9.28e-29
41	244	16.9	220	2	I50588 FGF-3 - chicken	6.09e-28
42	236	16.4	125	2	A32484 basic fibroblast grow	2.57e-26
43	236	16.4	237	1	S39582 transforming protein	2.57e-26
44	235	16.3	208	2	S14192 fibroblast growth fac	4.09e-26
45	234	16.2	97	2	B46289 keratinocyte growth f	6.52e-26

ALIGNMENTS

RESULT	1	A33665	#type complete
ENTRY		acidic fibroblast growth factor 1 precursor - human	
TITLE		beta-EGF; endothelial cell growth factor beta;	
ALTERNATE_NAMES		heparin-binding growth factor 1	
ORGANISM		#formal name Homo sapiens #common name man	
DATE		10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999	
ACCESSIONS		A33665; A32316; S18217; A43804; A24662; JH0707; S35535; S35536; I39413; A23553; A24820; A24243; A24301; A26386; A53639	
REFERENCE		A33665	
#authors		Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Flddes, J.C.	
#journal		Biochem. Biophys. Res. Commun. (1989) 164:1121-1129	
#title		Structural analysis of the gene for human acidic fibroblast growth factor.	
#cross-references		MUID:90073637	
#accession		A33665	
#molecule_type		DNA	
#residues		1-155	#label MER
#cross-references		GB:M30491	
REFERENCE		A32316	
#authors		Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.	
#journal		Mol. Cell. Biol. (1989) 9:2387-2395	
#title		Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.	
#cross-references		MUID:89343957	
#accession		A32316	
#molecule_type		DNA	
#residues		1-155	#label WAN
#cross-references		GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768	
REFERENCE		S18217	
#authors		Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.; Chiu, I.M.	
#journal		Oncogene (1991) 6:1521-1529	
#title		Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients.	
#cross-references		MUID:92019819	
#accession		S18217	
#molecule_type		DNA	
#residues		1-155	#label WA2
#cross-references		EMBL:M23086	
REFERENCE		A43804	

#authors Chiu, I.M.; Wang, W.P.; Lehtoma, K.
 #journal Oncogene (1990) 5:755-762
 #title Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.
 #cross-references MUID:90265618
 #accession A43804
 ##molecule_type mRNA
 ##residues 1-155 ##label CHI
 ##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
 REFERENCE
 #authors Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.; Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.; Drohan, W.N.
 #journal Science (1986) 233:541-545
 #title Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.
 #cross-references MUID:86261805
 #accession A24662
 ##molecule_type mRNA
 ##residues 1-155 ##label JAY
 ##cross-references GB:M1361; NID:g181941; PIDN:AAA79245.1; PID:g181942
 REFERENCE
 #authors Yu, Y.L.; Kha, H.; Golden, J.A.; Migchelsen, A.A.J.; Goetzl, E.J.; Turck, C.W.
 #journal J. Exp. Med. (1992) 175:1073-1080
 #title An acidic fibroblast growth factor protein generated by alternate splicing acts like an antagonist.
 #cross-references MUID:92202857
 #accession JH0707
 ##molecule_type mRNA
 ##residues 1-155 ##label YUY
 ##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
 REFERENCE
 #authors Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris, S.E.; Myers, R.L.; Chiu, I.M.
 #journal Nucleic Acids Res. (1993) 21:489-495
 #title Cloning of two novel forms of human acidic fibroblast growth factor (aFGF) mRNA.
 #cross-references MUID:93181239
 #accession S35535
 ##status translation not shown
 ##molecule_type mRNA
 ##residues 1-58 ##label PAY
 #accession S35536
 ##status translation not shown
 ##molecule_type mRNA
 ##residues 1-58 ##label PA2
 #cross-references GB:L01487
 REFERENCE
 #authors Crumley, G.; Dionne, C.A.; Jaye, M.
 #journal Biochem. Biophys. Res. Commun. (1990) 171:7-13
 #title The gene for human acidic fibroblast growth factor encodes two upstream exons alternatively spliced to the first coding exon.
 #cross-references MUID:90365758
 #accession I39413
 ##status translation not shown
 ##molecule_type mRNA
 ##residues 1-40 ##label RES
 ##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170; GB:M60516; NID:g178232; PID:g553171
 REFERENCE
 #authors Harper, J.W.; Strydom, D.J.; Lobb, R.R.
 #journal Biochemistry (1986) 25:4097-4103
 #cross-references MUID:86296647
 #accession A23553
 ##molecule_type protein
 ##residues 16-155 ##label HAR
 REFERENCE
 #authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
 #journal Biochem. Biophys. Res. Commun. (1986) 138:611-617
 #title The complete amino acid sequence of human brain-derived

acidic fibroblast growth factor.
 #cross-references MUID:86295741
 #accession A24820
 ##molecule_type protein
 ##residues 16-155 ##label GIM
 REFERENCE
 #authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
 #journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
 #title Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities.
 #cross-references MUID:86186784
 #accession A24243
 ##molecule_type protein
 ##residues 16-47 ##label GIZ
 ##experimental_source brain
 REFERENCE
 #authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
 #journal FEBS Lett. (1986) 204:203-207
 #title Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors.
 #cross-references MUID:86275260
 #accession A24301
 ##molecule_type protein
 ##residues 16-30,'X',32-49 ##label GAU
 REFERENCE
 #authors Gautschi-Sova, P.; Muller, T.; Bohlen, P.
 #journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
 #title Amino acid sequence of human acidic fibroblast growth factor.
 #cross-references MUID:87048871
 #accession A26386
 ##molecule_type protein
 ##residues 16-155 ##label GA2
 ##experimental_source brain
 REFERENCE
 #authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.; Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.; Middaugh, C.R.
 #journal Biochemistry (1994) 33:7193-7202
 #title Interaction of nucleotides with acidic fibroblast growth factor (FGF-1).
 #cross-references MUID:94271773
 #accession A53639
 ##molecule_type protein
 ##residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',133-140,'X',142-152 ##label CHA
 GENETICS
 #gene GDB:FGF1; FGFA
 ##cross-references GDB:119909; OMIM:131220
 #map_position 5q31.3-5q33.2
 #introns 57/1; 91/3
 CLASSIFICATION #superfamily fibroblast growth factor
 KEYWORDS alternative splicing; growth factor; heparin binding
 FEATURE
 16-155 #product fibroblast growth factor 1 #status experimental
 129 #label MAT\
 #binding-site carbohydrate (Asn) (covalent) #status absent
 SUMMARY #length 155 #molecular-weight 17460 #checksum 9243
 Query Match 68.3%; Score 985; DB 1; Length 155;
 Best Local Similarity 93.8%; Pred. No. 5,53e-196;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;
 Db 13 TEKFLNP-PG--NYKKPKLLYCSNGGHFLRILPDGTVDRSDQHQLQLSAESVGEV 69
 :: |:: |
 Qy 55 SDFELSGSDANYKKPKLLYCSNGGHFLRILPDGTVDRSDQHQLQLSAESVGEV 114
 Db 70 YIKSTETGOYLANDTDGLLYGSQTPENECLFLERLEENHNTYISKKAENWFLGLKKN 129
 :: |:: |
 Qy 115 YIKSTETGOYLANDTDGLLYGSQTPENECLFLERLEENHNTYISKKAENWFLGLKKN 174

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Db 130 GSKRGRPRTHYGQKAILFLPLPVSSD 155
      |||
QY 175 GSKRGRPRTHYGQKAILFLPLPVSSD 200

RESULT 2
ENTRY #155 #label MAD
TITLE #residues 1-155 #label MAD
ALTERNATE_NAMES #cross-references GB:U36456
ORGANISM This protein is an inducer of neovascularization in angiogenic
          disease including atherosclerosis, cancer and inflammatory
          autoimmune disease.
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change

ACCESSIONS A60721
REFERENCE #authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
          H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene
          and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 67.1%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 9.67e-192;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKGTETGOYL 80
      :|||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKSTETGOYL 125
      :|||

Db 81 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 140
      :|||
QY 126 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 185
      :|||

Db 141 GOKAILFLPLPVSSD 155
      |||
QY 186 GOKAILFLPLPVSSD 200

Query Match 67.1%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 9.67e-192;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKGTETGOYL 80
      :|||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKSTETGOYL 125
      :|||

Db 81 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 140
      :|||
QY 126 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 185
      :|||

Db 141 GOKAILFLPLPVSSD 155
      |||
QY 186 GOKAILFLPLPVSSD 200

RESULT 3
ENTRY #155 #label HEB
TITLE #residues 1-155 #label HEB
ALTERNATE_NAMES #cross-references GB:M30641; NID:G193284; PIDN:AAA37618.1; PID:G309236
ORGANISM #formal_name Mus musculus #common_name house mouse
          17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
DATE 16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE #authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
          G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
          characterization of their expression patterns during
          embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:G193284; PIDN:AAA37618.1; PID:G309236
REFERENCE JC5231
#authors Madai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

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#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
          disease including atherosclerosis, cancer and inflammatory
          autoimmune disease.
GENETICS
#gene Fgf-1
#introns 57/1; 91/3
#superfamily fibroblast growth factor
CLASSIFICATION #length 155 #molecular-weight 17417 #checksum 9341
SUMMARY
Query Match 67.0%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.66e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKGTETGOYL 80
      :|||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKSTETGOYL 125
      :|||

Db 81 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 140
      :|||
QY 126 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 185
      :|||

Db 141 GOKAILFLPLPVSSD 155
      |||
QY 186 GOKAILFLPLPVSSD 200

RESULT 4
ENTRY #155 #label GOO
TITLE #type complete
ALTERNATE_NAMES acidic fibroblast growth factor 1 - rat
ORGANISM heparin-binding growth factor 1
          #formal_name Rattus norvegicus #common_name Norway rat
          28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
          16-Jul-1999
ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
          1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:956351; PIDN:CAA32448.1; PID:956352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 67.0%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.66e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKGTETGOYL 80
      :|||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESAGSEVYIKSTETGOYL 125
      :|||

Db 81 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 140
      :|||
QY 126 AMDTGLYSGQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPRTHY 185
      :|||

Db 141 GOKAILFLPLPVSSD 155
      |||
QY 186 GOKAILFLPLPVSSD 200

RESULT 5
ENTRY #155 #label fragment
TITLE #type fragment
ALTERNATE_NAMES acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
          31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
          31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#cross-references MUID:92062117 fibroblast growth factor (aFGF) from porcine heart.
#accession JH0476
#molecule_type mRNA
#residues 1-152 ##label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding site heparin (Lys) status predicted
SUMMARY
#length 152 #checksum 1124
Query Match 66.2%; Score 954; DB 2; Length 152;
Best Local Similarity 91.6%; Pred. No. 1.11e-188;
Matches 131; Conservative 6; Mismatches 3; Indels 3; Gaps 2;
Db 13 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHTQLQLSAESVGEV 69
M.; DiSalvo, J.; Thomas, K.
QY 55 SDDFELSGSDGANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHTQLQLSAESVGEV 114
Science (1985) 230:1385-1388
#cross-references MUID:86070224 Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
Db 70 YIKSTETGOLANDYGLLYGSGTSECLFLERLEENHNTYTSKKAENKWFVGLKKN 129
#cross-references MUID:86070224 Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
QY 115 YIKSTETGOLANDYGLLYGSGTSECLFLERLEENHNTYTSKKAENKWFVGLKKN 174
#cross-references MUID:86070224 Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
Db 130 GSKCRGPRTHYGOKAILFLPLPV 152
#molecule_type protein
QY 175 GSKCRGPRTHYGOKAILFLPLPV 197
#residues 16-155 ##label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704 Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#accession S03953
#molecule_type protein
#residues 16-45 ##label QUI
REFERENCE A91010
#authors Bohlén, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30,'X',32-34,'X',36-44 ##label BOH
REFERENCE A24477
#authors Crabb, J.W.; Armes, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatroplin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2,'GE',5-155 ##label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label B02
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label B03
#note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
#authors Strödyom, D.J.; Harper, J.W.; Lobb, R.R.
#journal Biochem. (1986) 25:945-951
#title Amino acid sequence of bovine brain derived class I heparin-binding growth factor.

#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR

REFERENCE
A60884
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; Disalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO

REFERENCE
A37892
#authors Kuo, M.D.; Huang, S.S.; Huang, J.-S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.

#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30,'X',32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76,'X',78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE
A61198
#authors Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class I heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.

#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26;28-50;53-110,'H',112,'NTY',134-155 #label HIL

REFERENCE
I46024
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.

#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA7063.1; PID:g412
#accession A34477
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.

#cross-references MUID:9008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24;121-127;134-143 #label SAS
#experimental_source heart
#comment The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.

#comment This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-126 (a region flanked by Lys-Lys dipeptides) and a number of neuropeptides, including a gastrin-releasing peptide from the pig

...: remainder of annotations omitted.

Query Match 63.6%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 5.63e-180;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGYFLRLPDGTVDGTRSDQHLQQLCAESIGEVYIKSTETGQFL 80
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRSDQHLQQLCAESVGEVYIKSTETGYL 125

Db 81 AMDPDGLLYCSQTPNECLFLERLEENHYNTYISKKAERHWFVGLKKNKSKLGPRTHF 140
QY 126 AMDPDGLLYCSQTPNECLFLERLEENHYNTYISKKAERHWFVGLKKNKSKRGPRTHY 185

Db 141 GQKAILFLPLPVSSD 155
QY 186 GQKAILFLPLPVSSD 200

RESULT 7
ENTRY #type complete
TITLE A60130 acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development.

#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.

#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30,'X',32-44,'X',46-48 #label RIS
#classification #superfamily fibroblast growth factor
#keywords growth factor

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SUMMARY          #length 155 #molecular-weight 17322 #checksum 7617
Query Match      63.5%; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 9.68e-180;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKPKLYCSNGGHFLRILPDGKVDGTRDRSDQHIQLQLSAEDVGEYIKSTAGQYL 80
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 125
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSLPGECLFLERLEENHYNTYISKHADKNFVGLKNGSKLGPRTYH 140
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTDGLYGSTPNECLFLERLEENHYNTYISKHAENFVGLKNGSKRGPRTHY 185
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSSD 200
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY   JW0055 #type complete
TITLE   fibroblast growth factor-1 - sheep
ALTERNATE_NAMES
ORGANISM for-1
DATE     #formal_name Ovis sp. #common_name sheep
        #formal_name Ovis sp. #sequence_revision 10-Jul-1998 #text_change
        07-May-1999
ACCESSIONS JW0055
REFERENCE   Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
            Donjerkovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
            Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
            W.H.
            Biochem. Biophys. Res. Commun. (1998) 246:182-191
            Primary structure of ovine fibroblast growth factor-1 deduced
            by protein and cDNA analysis.
            #cross-references MUID:98262939
            #accession JW0055
            #molecule_type mRNA
            #residues 1-155 #label GRI
COMMENT   This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
            in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY        #length 155 #molecular-weight 17557 #checksum 8890

Query Match      62.8%; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 2.16e-177;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

Qy 21 GNYKPKLYCSNGGHFLRILPDGKVDGTRDRSDQHIQLQLYAESTIGEYIKSTETGQFL 80
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 125
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSTPNECLFLERLEENHYNTYISKHADKNFVGLKNGSKLGPRTYH 140
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTDGLYGSTPNECLFLERLEENHYNTYISKHAENFVGLKNGSKRGPRTHY 185
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSSD 200
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY   A48834 #type complete
TITLE   basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE     #formal_name Gallus gallus #sequence_revision 18-Nov-1994 #text_change
        16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE   Borja, A.Z.; Meijers, C.; Zeller, R.
            Dev. Biol. (1993) 157:110-118
            Expression of alternatively spliced bgrf first coding exons
            and antisense mRNAs during chicken embryogenesis.
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#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note      sequence extracted from NCBI backbone (NCBIN:131000,
            NCBI:P:131001)

REFERENCE
S23636
Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
Development (1990) 109:387-393
Fibroblast growth factor during mesoderm induction in the
early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:g62855; PIDN:CAA40139.1; PID:g62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY        #length 189 #molecular-weight 20312 #checksum 8538

Query Match      36.2%; Score 522; DB 2; Length 189;
Best Local Similarity 54.5%; Pred. No. 1.58e-88;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 58 GHFKDPKLYCKNGGFFLRINPDGRVGDVREKSDPHIKLQLQAEERGVSITKGVSANREL 117
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 125
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 118 AMKEDGRLLALKATECEFFPERLESNNYTSRKYSYSD--WYVALKRTGQYKPKPTGP 175
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTDGLYGSTPNECLFLERLEENHYNTYISKHAENFVGLKNGSKRGPRTHY 185
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 176 GOKAILFLPLPVSS 189
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSS 199
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY   S00185 #type complete
TITLE   basic fibroblast growth factor - sheep
ALTERNATE_NAMES
ORGANISM #formal_name Ovis orientalis aries, Ovis ammon aries
        #common_name domestic sheep
DATE     10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
        10-Sep-1999
ACCESSIONS S00185
REFERENCE   Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
            E.C.; Rubira, M.R.; Burgess, A.W.
            FEBS Lett. (1987) 224:128-132
            Primary structure of ovine pituitary basic fibroblast growth
            factor.
            #cross-references MUID:88055577
            #accession S00185
            #molecule_type protein
            #residues 1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS      growth factor; heparin binding; mitogen
FEATURE
107-110
18-22
SUMMARY        #region heparin binding #status predicted\
            #region heparin binding #status predicted\
            #length 146 #molecular-weight 16434 #checksum 3560

Query Match      35.8%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 3.60e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 15 GHFKDPKLYCKNGGFFLRINPDGRVGDVREKSDPHIKLQLQAEERGVSITKGVCANLYL 74
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 125
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
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Db	75	AMKEDGRLASKVCDECFERLENNNTVRSKYS-SWYALKRTGYKLGPKTKP	132
Qy	126	AMTDGILLYGSPNPEICFLERLEENHYNTYISKHAEKNFVGLKNGSKRGPRTH	185
Db	133	GOKAILFLPMPSAKS	146
Qy	186	GOKAILFLPLPVSS	199
RESULT	11		
ENTRY		GXBOB	#type fragment
TITLE			basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES			bFGF; kidney-derived growth factor; prostatripin
ORGANISM			#formal_name Bos primigenius taurus #common_name cattle
DATE			13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change 10-Sep-1999
ACCESSIONS			A24663; A32878; A33784; A61550; A61551; A60310; A61094; A01386; A60316; A22054; A24819
REFERENCE			A94290
#authors			Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal			Science (1986) 233:545-548
#title			Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.
#cross-references			MUID:86261806
#accession			A24663
#molecule_type			mrna
#residues			3-157 #label ABR
#cross-references			GB:R13440; NID:g163049; PIDN:AAA30518.1; PID:g163050
#experimental_source			pituitary gland
REFERENCE			A90924
#authors			Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes, J.C.
#journal			Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title			Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells.
#cross-references			MUID:87217066
#accession			A32878
#molecule_type			mrna
#residues			3-157 #label AB2
REFERENCE			A33784
#authors			Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel, N.R.; Deuel, T.F.
#journal			Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title			A novel 17 KD heparin-binding growth factor (HBGF-8) in bovine uterus: purification and N-terminal amino acid sequence.
#cross-references			MUID:90121211
#accession			A33784
#molecule_type			protein
#residues			1-14 #label MIL
#note			demonstration of a possible alternative initiator or splice junction
REFERENCE			A61550
#authors			Bertolini, J.; Hearn, M.T.W.
#journal			Mol. Cell. Endocrinol. (1987) 51:187-199
#title			Isolation, characterisation and tissue localisation of an N-terminal-truncated variant of fibroblast growth factor.
#cross-references			MUID:87247652
#accession			A61550
#molecule_type			protein
#residues			16-35 #label BER
REFERENCE			A61551
#authors			Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal			Mol. Cell. Endocrinol. (1987) 49:189-194
#title			Isolation and partial characterization of basic fibroblast growth factor from bovine testis.
#cross-references			MUID:87162856
#accession			A61551
#molecule_type			protein
#residues			27-35, 'X', 37-41 #label UE3
#experimental_source			testes
#note			this form appears to be identical to the renal form


```

CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
#form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
#form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
#form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
#length 157 #checksum 1115

MMARY
Query Match 35.8%; Score 516; DB 1; Length 157;
Best Local Similarity 55.2%; Pred. No. 3.60e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 26 GHEKDPKRYCKNGGFFRIHPDGVGVREKSDPHIKLOLQAEERGVSIVKGVCANRYL 85
QY 66 ANKKPKLLYCSNGGFFRIHPDGVGVREKSDPHIKLOLQAEERGVSIVKGVCANRYL 125
Db 86 AMKEDGRLLACKVDECFERLESNNYTRSRKYS--SWYVALKRTGYKLGPKTGP 143
QY 126 AMDTDLGYGSOTPNBECFLERLEENYNYISKHKEKNFVGLKNGSKRGPRTHY 185
Db 144 GOKAILFLPMGAKS 157
QY 186 GOKAILFLPVSS 199

RESULT 12
ENTRY A32398 #type complete
TITLE basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS basic fibroblast growth factor, 18K form
ORGANISM #fornal_name Homo sapiens #common_name man
DATE 31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
SESSIONS A32398; A61537; A26642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
REFERENCE A32398
#authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lellias,
J.N.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues 1-210 #label PRA
##cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE A61537
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal Growth Factors (1991) 4:277-287
#title Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues 1-114 #label SHI
#note authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues 56-210 #label KUR
##cross-references GB:M7968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE A90924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX',86-88,'X',90-91,'X',93-95 #label SH3
#experimental_source C-1121 hepatocellular carcinoma cell line
#note sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues 'XXX',19,'X',21-29 #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI
REFERENCE A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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Db 141 GOKAILFLPMSAKS 154
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Qy 186 GOKAILFLPLPVSS 199

RESULT 14
ENTRY A31674 #type complete
TITLE basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 21-May-1990 #sequence_revision 21-May-1990 #text_change
16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE A31674
#authors Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
Cooksey, K.; Baird, A.; Ling, N.
#journal Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of
its mRNA.
#cross-references MUID:89061721
#accession A31674
#molecule_type mRNA
##residues 1-154 ##label SHI
##cross-references GB:M22427; NID:g204285; PIDN:AAA41210.1; PID:g204286
REFERENCE S00876
#authors Kurokawa, T.; Seno, M.; Igarashi, K.
#journal Nucleic Acids Res. (1988) 16:5201
#title Nucleotide sequence of rat basic fibroblast growth factor
cDNA.
#cross-references MUID:88262516
#accession S00876
#molecule_type mRNA
##residues 1-154 ##label KUR
##cross-references EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204
REFERENCE S24309
#authors El-Husseini, A.E.D.; Paterson, J.A.; Mval, Y.; Shiu, R.P.C.
#journal Biochim. Biophys. Acta (1992) 1131:314-316
#title PCR detection of the rat brain basic fibroblast growth factor
(bFGF) mRNA containing a unique 3' untranslated region.
#cross-references MUID:92329546
#accession S24309
##status preliminary; translation not shown
##molecule_type mRNA
##residues 35-154 ##label ELH
##cross-references EMBL:X61697; NID:g56143; PIDN:CAA43863.1; PID:g56144
CLASSIFICATION #superfamily fibroblast growth factor
SYNOPSIS
growth factor
#domain signal sequence #status predicted #label SIG\
#product basic fibroblast growth factor #status
predicted #label MAT
SUMMARY #length 154 #molecular-weight 17139 #checksum 3026
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Best Local Similarity 54.5%; Pred. No. 2,32e-85;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLKNGGFFLRHPDGRVDGVRKSDPHVKLQQAERGVSIVKVCANRYL 82
::: || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 125
::: || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 83 AMKEDGRLLASKVTECEFFERLESNNYTSRKYS--SWYVALKRTGQYKLGSKTGP 140
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Qy 126 AMTDLGLYGSPNPEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185
|| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 141 GOKAILFLPMSAKS 154
|||||:|
Qy 186 GOKAILFLPLPVSS 199

RESULT 15
ENTRY S31622 #type fragment

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TITLE basic fibroblast growth factor - short-tailed opossum
(Monodelphis domestica) (fragment)
ORGANISM #formal_name Monodelphis domestica
DATE 20-Feb-1995 #sequence_revision 20-Feb-1995 #text_change
12-Apr-1995
ACCESSIONS S31622
REFERENCE S31622
#authors Kusewitt, D.F.; Sabourin, C.L.K.; Budge, C.L.; Ley, R.D.
#submission submitted to the EMBL Data Library, September 1992
#description Characterization of cDNA encoding basic fibroblast growth
factor of the marsupial Monodelphis domestica.
#accession S31622
##status preliminary
##molecule_type DNA
##residues 1-164 ##label KUS
##cross-references EMBL:Z15154
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 164 #checksum 5156
Query Match 34.5%; Score 498; DB 2; Length 164;
Best Local Similarity 54.5%; Pred. No. 4,18e-83;
Matches 73; Conservative 22; Mismatches 37; Indels 2; Gaps 1;

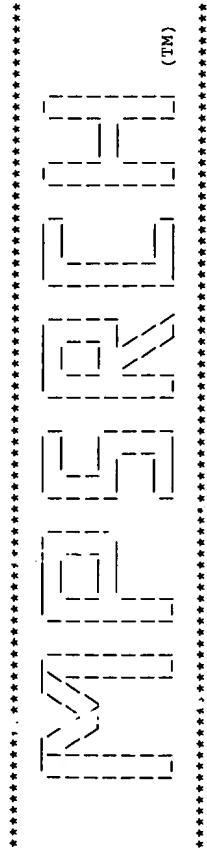
Db 33 GHFKDPKRLKNGGFFLRHPDGRVDGVRKSDPHVKLQQAERGVSIVKVCANRYL 92
::: || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 125
::: || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 93 AMKEDGRLLALKVTECEFFERLESNNYTSRKYS--NWYVALKRTGQYKLGSKTGP 150
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Qy 126 AMTDLGLYGSPNPEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185
|| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 151 GOKAILFLPMSAKS 164
|||||:|
Qy 186 GOKAILFLPLPVSS 199

Search completed: Tue Aug 29 15:52:27 2000
Job time : 16 secs.

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MPsrch_pp prot.in - protein database search, using Smith-Waterman algorithm

On: Tue Aug 29 15:49:04 2000; MasPar time 7.81 Seconds
793.887 Million cell updates/sec

Molecular output not generated.

Title: US-09-121-017B-17
Description: 1-2007 from-US09121017B.pep
Perfect Score: 1.42
Sequence: 1 MAPARLFAALLFFVGGVAES.....PRTHYGOKAILFLPLPVSSD 200

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: swiss-prot38
:SWISSprot

Statistics: Mean 45.057; Variance 70.010; scale 0.644

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	68.3	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 4.07e-222
2	967	67.1	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 2.61e-217
3	966	67.0	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 4.82e-217
4	954	66.2	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH 7.69e-214
5	917	63.6	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 5.59e-204
6	916	63.5	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 1.03e-203
7	522	36.2	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 2.08e-100
8	516	35.8	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 7.16e-99
9	516	35.8	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 7.16e-99
10	509	35.3	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 4.42e-97
11	508	35.2	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 7.97e-97
12	508	35.2	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 7.97e-97
13	498	34.5	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 2.85e-94
14	493	34.2	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 5.38e-93
15	466	32.3	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 3.94e-86
16	455	31.6	198	1	SDC4_HUMAN	SYNDECAN-4 PRECURSOR (2.40e-83
17	360	25.0	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR 1.25e-59
18	350	24.3	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR 3.57e-57
19	350	24.3	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR 3.57e-57
20	350	24.3	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR 3.57e-57
21	329	22.8	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT 4.71e-52
22	324	22.5	207	1	FGFG_RAT	FIBROBLAST GROWTH FACT 7.68e-51
23	302	20.9	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA 1.53e-45

24	301	20.9	202	1	SDC4_RAT	SYNDECAN-4 PRECURSOR (2.65e-45
25	299	20.7	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA 7.99e-45
26	295	20.5	194	1	FGF7_MOUSE	FIBROBLAST GROWTH FACT 7.21e-44
27	288	20.0	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT 3.34e-42
28	278	19.3	284	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 7.80e-40
29	277	19.2	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT 1.34e-39
30	277	19.2	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT 1.34e-39
31	275	19.1	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT 3.98e-39
32	276	19.1	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT 2.31e-39
33	276	19.1	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT 2.31e-39
34	274	19.0	247	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 6.84e-39
35	273	18.9	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT 1.18e-38
36	273	18.9	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT 1.18e-38
37	271	18.3	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FACT 3.47e-38
38	269	18.7	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT 1.02e-37
39	268	18.6	198	1	SDC4_MOUSE	SYNDECAN-4 PRECURSOR (1.76e-37
40	266	18.4	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT 5.17e-37
41	266	18.4	256	1	FGF3_BRARE	FIBROBLAST GROWTH FACT 5.17e-37
42	263	18.2	225	1	FGFB_HUMAN	FIBROBLAST GROWTH FACT 2.60e-36
43	257	17.8	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT 6.51e-35
44	256	17.8	243	1	FGFC_HUMAN	FIBROBLAST GROWTH FACT 1.11e-34
45	255	17.7	206	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT 1.90e-34

ALIGNMENTS

RESULT 1	FGF1_HUMAN	STANDARD;	PRT; 155 AA.
ID	P05230; P07502;		
AC	DT 13-AUG-1987 (Rel. 05, Created)		
DT	DT 13-AUG-1987 (Rel. 05, Last sequence update)		
DT	DT 15-JUL-1999 (Rel. 38, Last annotation update)		
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA)		
DE	GN FGF1 OR FGFA.		
OS	Homo sapiens (Human).		
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;		
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.		
RN	[1]		
RP	SEQUENCE FROM N.A.		
RX	MEDLINE; 86261805.		
RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;		
RA	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization."		
RT	Science 233:541-545(1986).		
RL	[2]		
RN	SEQUENCE FROM N.A.		
RP	TISSUE-BRAIN STEM;		
RX	MEDLINE; 89343957.		
RA	Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;		
RA	"Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues."		
RT	Mol. Cell. Biol. 9:2387-2395(1989).		
RL	[3]		
RN	SEQUENCE FROM N.A.		
RP	TISSUE-BRAIN STEM;		
RX	MEDLINE; 90265618.		
RA	Chiu I.M., Wang W.P., Lehtoma K.;		
RA	"Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1."		
RT	Oncogene 5:755-762(1990).		
RL	[4]		
RN	SEQUENCE FROM N.A.		
RP	MEDLINE; 90073637.		
RX	Mergia A., Fischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;		
RA	"Structural analysis of the gene for human acidic fibroblast growth factor."		
RT	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).		
RL	[5]		
RN	SEQUENCE FROM N.A.		
RP			

RT MEDLINE; 92019819.
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;
RT "Cloning and sequence analysis of the human acidic fibroblast growth
RT factor gene and its preservation in leukemia patients.";
RL Oncogene 6:1521-1529(1991).
[6]
RN
RP SEQUENCE FROM N.A.
RA MEDLINE; 92202857.
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,
RA Turk E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist.";
RL J. Exp. Med. 175:1073-1080(1992).
[7]
RN
RP SEQUENCE OF 1-154 FROM N.A.
RA MEDLINE; 94069734.
RA Zhao X.M., Yech T.K., Hiebert M., Frist W.H., Miller G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
[8]
RN
RP SEQUENCE OF 1-40 FROM N.A.
RA MEDLINE; 90365758.
RA Crumley G., Dionne C.A., Jaye M.;
RT "The gene for human acidic fibroblast growth factor encodes two
RT upstream exons alternatively spliced to the first coding exon.";
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).
[9]
RN
RP SEQUENCE OF 16-155.
RA MEDLINE; 86296647.
RA Harper J.W., Strydom D.J., Lobb R.R.;
RT "Human class I heparin-binding growth factor: structure and homology
RT to bovine acidic brain fibroblast growth factor.";
RL Biochemistry 25:4037-4103(1986).
[10]
RN
RP SEQUENCE OF 16-155.
RA MEDLINE; 86295741.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "The complete amino acid sequence of human brain-derived acidic
RT fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).
[11]
RN
RP SEQUENCE OF 16-155.
RA MEDLINE; 87048871.
RA Gautschi-Sova P., Mueller T., Boehlen P.;
RT "Amino acid sequence of human acidic fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).
[12]
RN
RP SEQUENCE OF 16-47.
RA MEDLINE; 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
RT amino terminal sequences and specific mitogenic activities.";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
[13]
RN
RP SEQUENCE OF 16-49.
RA MEDLINE; 86275260.
RA Gautschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
RT human brain: acidic and basic fibroblast growth factors.";
RL FEBS Lett. 204:203-207(1986).
[14]
RN
RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
RA MEDLINE; 96194129.
RA Blaber M., Disalvo J., Thomas K.A.;
RT "X-ray crystal structure of human acidic fibroblast growth factor.";
RL Biochemistry 35:2086-2094(1996).
[15]
RN
RP STRUCTURE BY NMR OF 24-155.
RA MEDLINE; 94358885.
RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,
RA Gimenez-Gallego G.;
RT "1H-NMR assignment and solution structure of human acidic fibroblast
RT growth factor activated by inositol hexasulfate.";
RL J. Mol. Biol. 242:81-98(1994).
[16]
RN
RP STRUCTURE BY NMR OF 24-155.
RX MEDLINE; 97107535.
RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
RA Rico M., Gimenez-Gallego G.;
RT "Three-dimensional structure of acidic fibroblast growth factor in
RT solution: effects of binding to a heparin functional analog.";
RL J. Mol. Biol. 264:162-178(1996).
[17]
RN
RP STRUCTURE BY NMR OF 25-155.
RX MEDLINE; 98387896.
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral
RT action of suramin and suradistas.";
RL J. Mol. Biol. 281:899-915(1998).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES bFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC or send an email to license@isb-sib.ch).
CC
CC EMBL; M13361; AAA79245.1;
CC EMBL; X51943; CAA36206.1;
CC EMBL; X30492; AAA52446.1;
CC EMBL; M30490; AAA52446.1; JOINED.
CC EMBL; M30491; AAA52446.1; JOINED.
CC EMBL; M60515; AAA51672.1;
CC EMBL; M60516; AAA51673.1;
CC EMBL; M23087; AAA52638.1;
CC EMBL; M23086; AAA52638.1; JOINED.
CC EMBL; S67291; AAB29057.1;
CC EMBL; X65778; CAA46661.1;
CC PIR; A23553; A23553.
CC PIR; A24243; A24243.
CC PIR; A24301; A24301.
CC PIR; A24662; A24662.
CC PIR; A24820; A24820.
CC PIR; A26386; A26386.
CC PIR; A33665; A33665.
CC PIR; S18217; S18217.
CC PDB; 2AFG; 15-OCT-95.
CC PDB; 1AXM; 22-APR-98.
CC PDB; 2AXM; 22-APR-98.
CC PDB; 1RML; 11-NOV-98.
CC MIM; 131220;
CC PRINTS; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HGFEGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
KW 3D-structure.
FT PROPEP 1 15 HEPARIN-BINDING GROWTH FACTOR 1.
FT CHAIN 16 155 ACETYLATION.
FT MOD_RES 2 2
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17460 MW; F586E8BFB09F1580 CRC64;

Db	21	GNYPKPLYCSNGGHFLRLPDGTVGTRDSQHIQLQLSAESAGEVYIKGTGQYL	80
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		:	:
Qy	126	AMDTGLLYGSGTPNEECFLERLEENHYNTYSKKHAEKNFVGLKNGSCKRGPRTHY	185
		:	:
Db	141	GQKAILFLPLPVSSD	155
		:	:
Qy	186	GQKAILFLPLPVSSD	200
		:	:

RX MEDLINE; 87156586.
RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;
RT "Amino-terminal sequence of a large form of basic fibroblast growth
factor isolated from human benign prostatic hyperplastic tissue.";
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).
RN [9]
RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
RX MEDLINE; 91195367.
RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;
RT "Three-dimensional structure of human basic fibroblast growth
factor.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).
RN [10]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 94004464.
RA Eriksson A.E., Cousens L.S., Matthews B.W.;
RT "Refinement of the structure of human basic fibroblast growth factor
at 1.6-A resolution and analysis of presumed heparin binding sites by
selenate substitution.";
RL Protein Sci. 2:1274-1284(1993).
RN [11]
RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).
RX MEDLINE; 91195368.
RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;
RT "Three-dimensional structure of human basic fibroblast growth factor,
a structural homolog of interleukin 1 beta.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).
RN [12]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 92121151.
RA Ago H., Kitagawa Y., Fujishima A., Matsura Y., Katsube Y.;
RT "Crystal structure of basic fibroblast growth factor at 1.6-A
resolution.";
RL J. Biochem. 110:360-363(1991).
RN [13]
RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).
RX MEDLINE; 91095983.
RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
RT "Three-dimensional structures of acidic and basic fibroblast growth
factors.";
RL Science 251:90-93(1991).
RN [14]
RP STRUCTURE BY NMR.
RX MEDLINE; 97040521.
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;
RT "High-resolution solution structure of basic fibroblast growth factor
determined by multidimensional heteronuclear magnetic resonance
spectroscopy.";
RL Biochemistry 35:13552-13561(1996).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; M17599; AAA52534.1; ALT_INIT.
DR EMBL; X04431; CAA28027.1; -
DR EMBL; X04432; CAA28028.1; -
DR EMBL; X04433; CAA28029.1; -
DR EMBL; M27968; AAA52448.1; -
DR EMBL; J04513; AAA52533.1; ALT_INIT.

DR PIR; A25824; A25824.
DR PIR; A26642; A26642.
DR PIR; B24243; B24243.
DR PIR; B24301; B24301.
DR PIR; B32878; B32878.
DR PIR; S00297; S00297.
DR PDB; 2FGF; 15-APR-92.
DR PDB; 4FGF; 15-JUL-93.
DR PDB; 1FGA; 15-JUL-93.
DR PDB; 1BFB; 03-APR-96.
DR PDB; 1BFC; 03-APR-96.
DR PDB; 1BFF; 16-JUN-97.
DR PDB; 1BFG; 31-JAN-94.
DR PDB; 2BFH; 30-APR-94.
DR PDB; 1BLA; 08-NOV-96.
DR PDB; 1BLD; 08-NOV-96.
DR MIM; 134920; -
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGF.FGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding;
KW 3D-structure. 1 9
FT PROPEP 10 155
FT CHAIN 10 155
FT SITE 46 48
FT SITE 88 90
FT BINDING 27 31
FT BINDING 116 119
FT STRAND 30 34
FT TURN 35 38
FT STRAND 39 43
FT TURN 45 46
FT TURN 49 52
FT TURN 55 56
FT TURN 58 60
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FT TURN 69 70
FT STRAND 71 76
FT TURN 77 80
FT STRAND 81 85
FT TURN 87 88
FT STRAND 91 94
FT HELIX 99 101
FT STRAND 103 107
FT TURN 109 110
FT STRAND 113 117
FT STRAND 121 122
FT STRAND 124 124
FT STRAND 127 127
FT TURN 129 130
FT STRAND 132 133
FT HELIX 136 138
FT TURN 141 142
FT HELIX 144 146
FT STRAND 148 152
SQ SEQUENCE 155 AA; 17254 MW; BE6CE13373007129 CRC64;
Query Match 35.3%; Score 509; DB 1; Length 155;
Best Local Similarity 54.5%; Pred. No. 4.42e-97;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 24 GHFKDPKRLCYCKNGGFLRHPDGRVGVREKSDPHIKLQLOAEERGVSIVKGVCANRYL 83
QY 66 ANYKPKRLCYCKNGGFLRHPDGRVGVREKSDPHIKLQLOAEERGVSIVKGVCANRYL 125
Db 84 AKNEKEDRLASKCVTDCECFERLESNNNTYRSRYT--SWVALKRTGQYKLGSKTP 141
QY 126 AMDTDGLLYCSQTPNEECLEFLERLEENHYTYSKKHAENFVGLKNGSKCRGPRTHY 185
Db 142 GQKAILFLPNSAKS 155
QY 186 GQKAILFLPVSS 199

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RESULT 11
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basilio C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
Dev. Biol. 138:454-463(1990).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC or send an email to license@isb-sib.ch).
CC
CC EMBL; M30644; AAA37621.1; -
DR PIR; C37360; C37360.
DR MGD; MGI:95516; FGF2.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGF_FGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

Query Match 35.2%; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 7.97e-97;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLCYKNGFFLRHPDGRVDGVREKSDPHVKLQLOAERGVVYSKVCANYL 82
QY :::: || || || || || || || || || || || || || || || || || || ||
66 ANYKKPKLLYCSNGGFFLRILPDGTVGTRDSQDHIQLQSAESVGEVYIKSTETGYL 125
Db 83 ANKEDGRLLASCVTEECFFERLESNNYTYRSKYS--SNVVALKRTGQYKLGSKTGP 140
QY || || || || || || || || || || || || || || || || || || || ||
126 AMDTGLLYGTSPTNEECFLERLENHYNTIISKHAKNFWVLKKNKSGCKRGPRTHY 185
Db 141 GKAKILFLPMSAKS 154
QY |||||::: |
186 GKAKILFLPLVSS 199

RESULT 12
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;

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DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;
RX MEDLINE; 89061721.
RA Shimazaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RT "Complementary DNA cloning and sequencing of rat ovarian basic
RT fibroblast growth factor and tissue distribution study of its mRNA.";
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RX TISSUE-BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
RL Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
RT "Cloning of the rat fibroblast growth factor-2 promoter region and
RT its response to mitogenic stimuli in glioma C6 cells.";
RL J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
RT "PCR detection of the rat brain basic fibroblast growth factor (BFGF)
RT mRNA containing a unique 3' untranslated region.";
RL Biochim. Biophys. Acta 1131:314-316(1992).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; M22427; AAA41210.1; -
DR EMBL; X07285; CAA30265.1; -
DR EMBL; U78079; AAC53225.1; -
DR EMBL; X61697; CAA43863.1; -
DR PIR; S00876; S00876.
DR PIR; A31674; A31674.
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGF_FGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.

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Matches 73; Conservative 22; Mismatches 37; Indels 2; Gaps 1;

D 25 GHFKDPKRLCKNGGFFLRHPDGRVGDIREKSDPNIKLQQAEEGVWSIKGVCANRYL 84
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Q 66 ANYKKPKLLCSNGGHFLRILPDGTVDGTRDSRDOHIQLQLSAESVGVIYIKSTETGOYL 125
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D 85 AMREDDGLLALKYVTESCFFERLESNNYTYISRSKY--NWYVALKRTGOYLKSGTKGP 142
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Q 126 AMDPTDGLLYGSOTPNESCLFLEENHNYTISKHAENWFYGLAKKGSKRGPRTHY 185
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D 143 GQRAILELPMSAKS 156
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Q 186 GQRAILEPLPVSS 199
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RESULT 14

ID FGF2_XENLA STANDARD; PERT; 155 AA.

AC P12226;
DT 01-OCT-1989 (Rel. 12, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BEGF).
DE DE GROWTH FACTOR) (BEGF).
GN FGF2 OR FGF-2.
OS xenopus laevis (African clawed frog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae; Pipidae;
OC Xenopodinae; Xenopus.
RN [1]
RC SEQUENCE FROM N.A.
RP MEDLINE; 89058621.
RX Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;
RA "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer."
RT Science 242:1053-1056(1988).
RL [2]
RR SEQUENCE OF 95-155 FROM N.A.
RX MEDLINE; 88052890.
RX Kimelman D., Kirschner M.;
RA "Synergistic induction of mesoderm by FGF and TGF-beta and the RT identification of an mRNA coding for FGF in the early Xenopus embryo."
RL Cell 51:869-877(1987).
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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D ENBL; M18067; AAA49726.1;
DR PIR; A29618; A29618.
DR PIR; A40117; A40117.
DR HSP; P05038; IEF.
DR PRAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHGFG.
DR PRINTS; PR00263; HBGF.FGF.
DR PROSITE; PS00247; HBGF.FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
FT CONFLICT 111 111 MISSING (IN REF. 2).
SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 34.2%; Score 493; DB 1; Length 155;
Best Local Similarity 50.7%; Pred. No. 5.38e-93;
Matches 74; Conservative 27; Mismatches 43; Indels 2; Gaps 1;


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on: Tue Aug 29 15:50:22 2000; MasPar time 18.31 Seconds
757.385 Million cell updates/sec
molecular output not generated.

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Scoring table: PAM 150
Gap 11Post-processing: Minimum Match 0%
Listing first 45 summaries

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4:sp_4
5:sp_5
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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being predicted and is derived by analysis of the total score distribution.

Result No.	Query			DB	ID	Description	pred. No.
	Score	Match	Length				
1	511	35.4	130	6	077767	BASIC FIBROBLAST GROWTH	1.91e-100
2	509	35.3	196	4	P78443	21 KD BASIC FIBROBLAST	5.40e-100
3	382	26.5	101	13	P79706	BASIC FGF (FRAGMENT)	5.01e-6
4	346	24.0	146	13	Q07659	FIBROBLAST GROWTH FACT	6.50e-58
5	313	21.7	115	11	Q60487	BASIC FIBROBLAST GROWTH	1.13e-49
6	305	21.2	212	13	Q42407	FIBROBLAST GROWTH FACT	1.07e-47
7	301	20.9	194	6	P79150	KERATINOCYTE GROWTH FA	1.04e-46
8	274	19.0	252	11	O89096	PHF-4B.	4.11e-40
9	268	18.6	198	11	Q35988	RYUDOCAN CORE PROTEIN	1.16e-38
10	265	18.4	59	4	Q16089	ACIDIC FIBROBLAST GROW	6.15e-38
11	266	18.4	60	4	Q16588	ACIDIC FIBROBLAST GROW	3.53e-38
12	264	18.3	70	11	O54937	FIBROBLAST GROWTH FACT	1.07e-37
13	260	18.0	196	13	Q9YH31	POTATIVE FIBROBLAST GR	9.79e-37
14	256	17.8	206	13	Q9YGD8	FIBROBLAST GROWTH FACT	8.90e-36
15	257	17.8	243	13	Q9W6A1	FIBROBLAST GROWTH FACT	5.13e-36
16	251	17.4	127	4	Q99517	FIBROBLAST GROWTH FACT	1.39e-34
17	248	17.2	192	4	O95830	FIBROBLAST GROWTH FACT	7.21e-34
18	248	17.2	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	7.21e-34
19	236	16.4	200	13	P79925	FIBROBLAST GROWTH FACT	4.97e-31
20	226	15.7	425	5	O76831	LET-756 PROTEIN.	1.09e-28

RESULT 7

[illegible]

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QY 74 LYCSNGHFLRILPDGTDRSDQHIQLOLSAESVGEVYKSTGTQYGLAMTDIGLL 133
Db 139 YPSELFTECKEKESVFENYVYISMLYRQOESGRANFLGNKSGQVKNRVKTKPA 198
QY 134 YGSOPTNEECLEFLRLEENHYTISK--KHAEE--KNMFVGLKNGSKRGRTHYGOKA 189
Db 199 AHFLPKPL 206
QY 190 ILFLPLPV 197

RESULT 9
ID Q35988 PRELIMINARY; PRT; 198 AA.
AC Q35988;
DT 01-JAN-1998 (TREMBLrel. 05, Created)
DT 01-JAN-1998 (TREMBLrel. 05, Last sequence update)
DE RYUDOCAN CORE PROTEIN PRECURSOR.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-C3H/AN, AND 129SVJ;
RX MEDLINE; 97420681.
RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;
RT "Molecular cloning, genomic organization, promoter activity, and
RT tissue-specific expression of the mouse ryudocan gene.";
RL J. Biochem. 122:17-24(1997).
CC - FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN
CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO
CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.
DR EMBL; D89571; BAA22135.1; -
DR EMBL; D89572; BAA22136.1; -
DR PROSITE; P500964; SYNDECAN; 1.
DR PFAM; PF01034; Syndecan; 1.
KW Signal; Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein.
FT SIGNAL 1 23 POTENTIAL.
FT CHAIN 24 198 POTENTIAL.
SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;

Query Match 18.6%; Score 268; DB 11; Length 198;
Best Local Similarity 77.1%; Pred. No. 1.16e-38;
Matches 54; Conservative 5; Mismatches 2; Indels 9; Gaps 6;

Db 1 MAPACLLAPLLLLLGGFLPVGESIRETEVIDPDQLLEGRYFSGALPDDEDA-G-G-S 56
1 MAPARLFA-LLLFFVGG----VA-ESIRETEVIDPDQLLEGRYFSGALPDDEVDVGGQES 55
57 DDFELSGSD 66
56 DDFELSGSD 65

RESULT 10
ID Q16089 PRELIMINARY; PRT; 59 AA.
AC Q16089;
DT 01-NOV-1996 (TREMBLrel. 01, Created)
DT 01-NOV-1996 (TREMBLrel. 01, Last sequence update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 94069734.
RA ZHAO X.M., YEOP T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
DR EMBL; S67294; AAB29059.1; -

QY 74 LYCSNGHFLRILPDGTDRSDQHIQLOLSAESVGEVYKSTGTQYGLAMTDIGLL 133
Db 139 YPSELFTECKEKESVFENYVYISMLYRQOESGRANFLGNKSGQVKNRVKTKPA 198
QY 134 YGSOPTNEECLEFLRLEENHYTISK--KHAEE--KNMFVGLKNGSKRGRTHYGOKA 189
Db 199 AHFLPKPL 206
QY 190 ILFLPLPV 197

RESULT 11
ID Q16588 PRELIMINARY; PRT; 60 AA.
AC Q16588;
DT 01-NOV-1996 (TREMBLrel. 01, Created)
DT 01-NOV-1996 (TREMBLrel. 01, Last sequence update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 94069734.
RA ZHAO X.M., YEOP T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
DR EMBL; S67294; AAB29059.1; -

Query Match 18.4%; Score 265; DB 4; Length 59;
Best Local Similarity 80.9%; Pred. No. 6.15e-38;
Matches 38; Conservative 6; Mismatches 2; Indels 3; Gaps 2;

Db 13 TEKNLPG--NYKKPKLLYCSNGHFLRILPDGTVDGTRDRSDQH 56
55 SDFELSGSDANYKKPKLLYCSNGHFLRILPDGTVDGTRDRSDQH 101

RESULT 12
ID Q54837 PRELIMINARY; PRT; 70 AA.
AC Q54837;
DT 01-JUN-1998 (TREMBLrel. 06, Created)
DT 01-JUN-1998 (TREMBLrel. 06, Last sequence update)
DE ACIDIC FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF012926; AAB94020.1; -
DR HSSP; P05230; 2AXM.
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DR PFAM; PF00167; FGF; 1.  
FT NON_TER 70  
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;  
  
Query Match 18.3%; Score 264; DB 11; Length 70;  
Best Local Similarity 97.2%; Pred.No. 1.07e-37;  
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
  
Db 35 GNKKPKLLYCSGGHFLRILPDGTVDGTRDRSDQH 70  
:|||||  
QY 66 ANYKPKLLYCSGGHFLRILPDGTVDGTRDRSDQH 101  
:  
  
RESULT 13  
ID Q9YH31 PRELIMINARY; PRT; 196 AA.  
AC Q9YH31;  
DT 01-MAY-1999 (TrEMBLrel. 10, Created)  
DT 01-MAY-1999 (TrEMBLrel. 10, Last sequence update)  
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
PUTATIVE FIBROBLAST GROWTH FACTOR-4.  
Notophthalmus viridescens (Eastern newt) (Triturus viridescens).  
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.  
OC [1]  
RN SEQUENCE FROM N.A.  
RP RP  
RA WEI Y.;  
RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.  
DR EMBL; U76998; AAC98812.1; -  
DR HSSP; P09038; 1BFF.  
DR PROSITE; PS00247; HBGF_FGF; 1.  
SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;  
  
Query Match 18.0%; Score 260; DB 13; Length 196;  
Best Local Similarity 34.6%; Pred.No. 9.79e-37;  
Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;  
  
Db 71 KRLRRLYCNVGIGFHLQVLPGDGRIGHGMHSES-RYSLEISPVGVCMFGVQSGLFLAM 129  
: : |||| : | : |||| : : : : |||| : : : : |||| : : : : ||||  
QY 69 KPCKLLYCSGGHF-LRILPDGTVDGTRDRSDQHIQLLSAESVGEVIKSTETGOYLAM 127  
:  
  
Db 130 NSKRGFLGSKFYFDECKFKMLPNYNAYESWRYPCM--YIALSNGRAKGNKVSPYM 187  
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QY 128 DTDLGYLGSTPNEECFLERLENHYNTYISKHAENWFVGLKNGSCKRGPRTHYGQ 187  
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Db 188 TVTHLP 194  
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188 KAILFLP 194  
  
RESULT 14  
ID Q9YGD8 PRELIMINARY; PRT; 206 AA.  
AC Q9YGD8;  
DT 01-MAY-1999 (TrEMBLrel. 10, Created)  
DT 01-MAY-1999 (TrEMBLrel. 10, Last sequence update)  
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
FIBROBLAST GROWTH FACTOR 6-RELATED PROTEIN.  
DE FN  
GN FGF6  
OS Oncorhynchus mykiss (Rainbow trout) (Salmo gairdneri).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Actinopterygii;  
OC Neopterygia; Teleostei; Euteleostei; Protacanthopterygii;  
OC Salmoniformes; Salmonidae; Oncorhynchus.  
OC [1]  
RN SEQUENCE FROM N.A.  
RP RP  
RX MEDLINE; 99096461.  
RA RESCAN P.Y.;  
RT "Identification of a fibroblast growth factor 6 (FGF6) gene in a non-mammalian vertebrate: continuous expression of FGF6 accompanies muscle fiber hyperplasia";  
RT Blochm., Biophys. Acta 1443:305-314(1998).  
RL EMBL; Y16850; CAA76422.1; -  
DR HSSP; P09038; 1BFF.  
DR PROSITE; PS00247; HBGF_FGF; 1.
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MPsrch_pp protein - protein database search, using Smith-waterman algorithm
run on: Tue Aug 29 15:56:15 2000; MasPar time 7.50 Seconds
        631.534 Million cell updates/sec
cubular output not generated.
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Result No.	Query		Length	DB	ID	Description	Pred. No.
	Score	Match					
1	985	68.5	154	1	W92283	Human beta-endothelial	2.14e-86
2	985	68.5	154	1	W75414	Human beta-endothelial	2.14e-86
3	985	68.5	154	1	W06818	Human endothelial cell	2.14e-86
4	985	68.5	154	1	W04805	Human beta-endothelial	2.14e-86
5	985	68.5	155	1	W75415	Human endothelial cell	2.14e-86
6	985	68.5	155	1	W75711	Fibroblast growth fact	2.14e-86
7	985	68.5	155	1	R00776	Fibroblast growth fact	2.14e-86
8	985	68.5	155	1	P704042	Sequence encoded by co	2.14e-86
9	985	68.5	155	1	P94037	Human acidic fibroblas	2.14e-86
10	985	68.5	155	1	W53022	Fibroblast growth fact	2.14e-86
11	985	68.5	155	1	R70812	FGF-1.	2.14e-86
12	985	68.5	155	1	W92291	Human endothelial cell	2.14e-86
13	985	68.5	165	1	R05785	Human BECGF encoded by	2.14e-86
14	985	68.5	168	1	W06818	Human endothelial cell	2.14e-86
15	983	68.4	134	1	W75413	Human alpha-endothelia	3.43e-86
16	983	68.4	134	1	W92282	Human alpha-endothelia	3.43e-86
17	983	68.4	134	1	W04807	Human alpha-endothelia	3.43e-86
18	984	68.4	140	1	W04806	Human acidic fibroblas	2.71e-86
19	984	68.4	140	1	R74647	Human recombinant aFGF	2.71e-86
20	984	68.4	140	1	R34497	Human acidic Fibroblas	2.71e-86
21	984	68.4	140	1	P70995	Sequence of human prot	2.71e-86
22	984	68.4	140	1	J25914	Human acidic fibroblas	2.71e-86
23	984	68.4	140	1	P90068	Human acidic fibroblast	2.71e-86

QY 115 YIKSTETGQYLAMDTDGLLYGSQTPNEE

Db 129 GSKRGRPRTHYGOKAILFLPLPVSSD 154
:::|||||
Qy 175 GSKRGRPRTHYGOKAILFLPLPVSSD 200

RESULT 2

ID W75414 standard; protein; 154 AA.
AC W75414;
DE 02-MAR-1999 (first entry)
DT Human beta-endothelial cell growth factor.
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
OS hybridisation; bovine; wound healing; prosthetic device.
Qy Homo sapiens.
PN US5827826-A.
PD 27-OCT-1998.
PE 04-NOV-1996; 743261.
PF 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, Maciag T;
WPI: 98-594032/50.
PT Compositions for promoting wound healing - containing endothelial
cell growth factor polypeptides
PS Claim 1; Column 16; 23pp; English.
CC This sequence represents the amino acid sequence of the mature human
beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
is identical to the alpha-ECGF but the beta sequence contains an extra
20 N-terminal amino acids. The sequence was isolated from a human brain
stem cell cDNA library using a probe designed based on fragments of the
bovine ECGF (see W75416-W75418). The ECGF protein can be used in
compositions for promoting wound healing. ECGF is also used to grow
cells on a prosthetic device.
Qy Sequence 154 AA;

Query Match 68.5%; Score 985; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 2.14e-86;
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFLNP-PG--NYKKPLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 68
:::|||||
Qy 55 SDFELSGSGDANYKKPLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 114
:::|||||
69 YIKSTETGOYLAAMDGLLYGSQTPNEECFLERLEENHNTYISKKHAENWVFLGKKN 128
:::|||||
115 YIKSTETGOYLAAMDGLLYGSQTPNEECFLERLEENHNTYISKKHAENWVFLGKKN 174
:::|||||
Db 129 GSKRGRPRTHYGOKAILFLPLPVSSD 154
:::|||||
Qy 175 GSKRGRPRTHYGOKAILFLPLPVSSD 200

RESULT 3

ID W06816 standard; Protein; 154 AA.
AC W06816;
DE 17-MAR-1997 (first entry)
DT Human endothelial cell growth factor-beta.
KW Endothelial cell growth factor-beta; ECGF-beta.
OS Homo sapiens.
PN US5571790-A.
PD 05-NOV-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE POULENC RORER PHARM INC.

PI Burgess W, Drohan WN, Jaye M, Maciag T;
WPI: 96-505421/50.
DR N-PSDB; T45983.
PT Recombinant human endothelial cell growth factors - for treating
damaged blood vessels, etc.
PS Claim 1; Column 16; 22pp; English.
CC Human recombinant endothelial cell growth factors (ECGF) beta
(W06816) and alpha (W06817) differ only at their N-terminal host
cells can be produced in transformed prokaryotic or eukaryotic host
from the complete human ECGF cDNA (T45985). Large quantities of
the ECGFs are produced by culturing the host cells and recovering
of endothelial cells in culture. They can potentially be used to
treat damaged blood vessels and other endothelial cell-lined
structures, and also have diagnostic applns.
Qy Sequence 154 AA;

Query Match 68.5%; Score 985; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 2.14e-86;
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFLNP-PG--NYKKPLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 68
:::|||||
Qy 55 SDFELSGSGDANYKKPLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 114
:::|||||
Db 69 YIKSTETGOYLAAMDGLLYGSQTPNEECFLERLEENHNTYISKKHAENWVFLGKKN 128
:::|||||
Qy 115 YIKSTETGOYLAAMDGLLYGSQTPNEECFLERLEENHNTYISKKHAENWVFLGKKN 174
:::|||||
Db 129 GSKRGRPRTHYGOKAILFLPLPVSSD 154
:::|||||
Qy 175 GSKRGRPRTHYGOKAILFLPLPVSSD 200

RESULT 4

ID W04805 standard; Protein; 154 AA.
AC W04805;
DE 29-DEC-1996 (first entry)
DT Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON) RHONE POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
WPI: 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
growth factor - useful to regenerate or treat damaged blood vessels
PS Disclosure; Fig 8; 28pp; English.
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
brain using heparin-Sepharose affinity chromatography. ECGF is
useful for, among other purposes, diagnostic applications and has
potential in the treatment of damaged blood vessels or other
endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
oligonucleotides (T37504 and T37508 to T37509) whose design is based
on the sequence of bovine alpha- and beta-ECGF.
Qy Sequence 154 AA;

Query Match 68.5%; Score 985; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 2.14e-86;
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

DI 07 DEC 1996 (first entry)
DE Fibroblast growth factor-1.
KW Fibroblast growth factor-1; FGF-1; muten; protein engineering;
KW heparin; thrombosis; thrombocytopenia; ophthalmic disorder.

WO9839436-A2.
11-SEP-1998.
03-MAR-1998. J008078.
03-MAR-1997. US-040785.
(EISA) EISAI CO LTD.
Kalyanaraman R, Kawai T, Zhu H;
WPI: 98-495843/42.
Fibroblast growth factor mutain and DNA - having reduced receptor
binding and able to bind heparin, useful for treating and regulating
heparin-related disorders e.g. thrombosis
Disclosure: Page 52; 71pp; English.
This is the amino acid sequence of fibroblast growth factor-1
(FGF-1). Claimed DNA molecules of the invention encode FGF mutain
polypeptides (see W75111-20) that show reduced FGF receptor binding
activity but which retain the ability to bind heparin. For FGF-1,
amino acid residues 100, 107 or 110 are preferably replaced by
other amino acid residues, with an optional further replacement of
the Glu-102 residue. The mutain may be further modified by
replacement of the Cys residues to reduce aggregation. The mutain
is obtained by site-specific or site-directed mutagenesis of FGF-1
DNA, incorporation of the mutated DNA into a vector and expression
in host cells. The FGF mutains are used to treat heparin-related
disorders, such as excessive bleeding induced by heparin,
ophthalmic disorders and heparin-associated thrombocytopenia and
thrombosis. They may also be used for drug design.
Sequence 155 AA;

Db 70 YIKSTGQYLANDTGLLYGSTPNEECFLERLEENHYTISKHAEKNWVGLKKN 129
 Qy 115 YIKSTGQYLANDTGLLYGSTPNEECFLERLEENHYTISKHAEKNWVGLKKN 174
 Db 130 GSKCRGRTHYGQKAILFLPLPVSSD 155

0Y 175 GSCKRGPRTHYGOKAILEFLPVSSD 200

RESULT 7

ID R80776 standard; Protein; 155 AA.
AC R80776;
DE 13-MAY-1996 (first entry).
DE DT Fibroblast growth factor 1, FGF-1.
DE KW Conjugate; fibroblast growth factor; FGF; cytotoxin; saporin; eye;
KW cell proliferation; regulation; pterygia; corneal clouding; cancer;
KW psoriasis; rheumatoid arthritis.
KW Homo sapiens.
PN WO9524928-A2.
PN 21-SEP-1995. PD 3D.
PF 15-MAR-1995. U03448.
PF 15-MAR-1994; US-213447.
PR 15-MAR-1994; US-213446.
PR (PRI2-) PRIZM PHARM INC.
BA Baird JA, Houston LL, Nova MP, Sosnowski BA;
WIPI: 95-336820/43.
DR New conjugates of growth factor receptor ligand and targetted agent
PT - partic. DNA or cytotoxin, used to control cell proliferation in
PT the eye, e.g. to prevent growth of pterygi and corneal clouding
PT Claim 33; Page 140-141; 204pp; English.
PS R80776-84 are fibroblast growth factors (FGF) FGF-1 to FGF-9
CC respectively, DNA encoding these fibroblast growth factors can be
CC used to create an FGF/saporin fusion protein. DNA encoding such fusion
CC proteins are useful for targetting saporin (a cytotoxin) to a cell
CC carrying the FGF receptor. Targetted agents (TA) other than saporin
CC which may be used include in partic. DNA encoding a therapeutic protein,
CC antisense DNA or other cytotoxic agent. The linker sequence within the
CC fusion protein may increase serum stability or intracellular
CC availability of the TA. The conjugates of the invention are used to
CC inhibit cell proliferation in cells carrying the particular growth
CC factor receptor; also when TA is DNA it can be used to deliver this
CC to cells (for gene therapy). A specific application is to prevent
CC excessive proliferation of epithelial cells, fibroblasts and
CC keratinocytes in the anterior eye after surgery, partic. to prevent
CC recurrence of pterygi after surgical removal, closure of
CC trabeculectomy after glaucoma surgery and corneal clouding after
CC excimer laser treatment. Other conditions which may be treated include
CC tumours, retinosis, psoriasis, Dupuytren's contracture, diabetic
CC complications, Kaposi's sarcoma and rheumatoid arthritis.
CC Sequence 155 AA.
SO

FT	protein	/label= Beta ECGF	
FT	16. .21		
FT	FT	/label= Acidic FGF	
FT	protein	22. .155	
FT	FT	/label= Alpha ECGF	
PN	W08705332-A.		
PD	11-SEP-1987.		
PD	02-MAR-1987; U00425.		
PR	03-MAR-1986; US-835594.		
PR	26-MAR-1987; ES-000812.		
PA	(MELO-) MELOY LAB INC.		
PA	(RORE-) RORER BIOTECHN INC.		
PA	(RORE-) RORER.		
PA	PA BIOTECH INC.		
PI	Jaye M, Burgess W, Maciag T, Drohan W;		
DR	WPI: 87-264128/37.		
DR	N-PSDB; N07088		
PT	Human endothelial cell growth factor - produced by recombinant		
PT	DNA techniques, useful for wound healing		
PT	Example; Fig 8; 43pp; English.		
CC	CC To screen the human brain stem cDNA library for clones contg. ECGF		
CC	inserts, a specific oligonucleotide was designed. This		
CC	oligonucleotide was based upon a partial AA sequence analysis of		
CC	the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets		
CC	forth for comparison the AA sequence of cyanogen bromide-cleaved		
CC	bovine alpha and beta ECGF (P70834). The two clones that were		
CC	isolated, ECGF-clones 1 and 29, were analysed in further detail. The		
CC	nucleotide sequence of these clones and the AA sequence deduced from		
CC	the nucleic acid sequence is shown in Fig 8 (see N07088 and P70482).		
CC	Sequence 155 AA;		
SC			

	Best Local Similarity	93.8%; pred. No. 2.14e-96;	Mismatches 1;	Indels 3;	Gaps 2;
	Matches 137;	Conservative 5;			
Db	13	TEKENLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESVGEV	69		
	:	: : : :	:	:	:
Qy	55	SDFELSGSDGANYYKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESVGEV	114		
	:	:	:	:	:
Db	70	YIKETGQYLAMTDGLLYGSQPNEECFLERLEENHYNTYSKKHAEKNFVGLKNN	129		
	:	:	:	:	:
Qy	115	YIKETGQYLAMTDGLLYGSQPNEECFLERLEENHYNTYSKKHAEKNFVGLKNN	174		
	:	:	:	:	:
Db	130	GSCKRGPRTHYGOKAILFLPLPVSSD	155		
	:	:	:	:	:
Ov	175	GSCKRGPRTHYGOKAILFLPLPVSSD	200		
	:	:	:	:	:

RESULT	8	
ID	P70482 standard; Protein; 155 AA.	
AC	P70482;	
DT	13-MAY-1991 (first entry)	
DE	Sequence encoded by complete cDNA sequence of human endothelial	
DE	cell growth factor (ECGF).	
DE	Endothelial cell regeneration; blood vessel regeneration.	
KW	Human sapiens.	
OS	Homo sapiens.	
FT	Key	Location/Qualifiers
FT	protein	2..15

Db 13 TEKNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDQHIQLQLSAESYGEV 69
 : : : : :
 QY 55 SDDFELSGSGDANYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDQHIQLQLSAESYGEV 114

Db 70 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 129
 : : : : :
 QY 115 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 174

Db 130 GSKCRGPRTHYGOKAILFLPLPVSSD 155
 : : : : :
 QY 175 GSKCRGPRTHYGOKAILFLPLPVSSD 200

RESULT 10
 ID W53022 standard; Protein; 155 AA.
 AC W53022
 DT 14-AUG-1998 (first entry)
 DE Fibroblast growth factor protein 1.
 KW FGF; cell growth; survival; differentiation; central nervous system;
 OS peripheral nervous tissue; treatment; diagnosis; cell culture.
 PI Mammalian.
 PA WO9808864-A1.
 PI 05-MAR-1998.
 PF 27-AUG-1997; U15237.
 PR 30-AUG-1996; US-705245.
 PA (UYJO) UNIV JOHNS HOPKINS SCHOOL MEDICINE.
 PI Nathans J, Snailwood PM;
 WI 98-179380/16.
 DT New fibroblast growth factor homologous factors - useful for, e.g.
 PT developing products for diagnosis and treatment of conditions
 PT involving neuro-degenerative and neoplastic disorders
 PS Disclosure: Page 50-51; 94pp; English.
 CC Fibroblast growth factor (FGF) proteins (W53022-W53024 and W53029-W53033)
 CC are members of the fibroblast growth factor family and have homology to
 CC Fibroblast growth factor homologous factor (FGF) proteins. The FGF
 CC proteins (FGF 1-4) are involved in regulating the growth, survival, and
 CC differentiation of cells in the central nervous system, as well as cells
 CC in peripheral nervous tissues. The proteins can therefore be used for
 CC treating and diagnosing conditions involving the nervous system. FGF's
 CC can also be used in methods for maintaining cultured cells or tissues or
 CC to promote neuron growth in vitro.
 SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

QY 13 TEKNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDQHIQLQLSAESYGEV 69
 : : : : :
 QY 55 SDDFELSGSGDANYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDQHIQLQLSAESYGEV 114

Db 70 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 129
 : : : : :
 QY 115 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 174

Db 130 GSKCRGPRTHYGOKAILFLPLPVSSD 155
 : : : : :
 QY 175 GSKCRGPRTHYGOKAILFLPLPVSSD 200

RESULT 11
 ID W70812 standard; protein; 155 AA.
 AC W70812
 DT 01-SEP-1995 (first entry)
 DE FGF-1.
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
 OS saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
 PI Homo sapiens.
 PA Location/Qualifiers
 FT misc_difference 31
 FT /note= "Cys may be replaced by Ser"
 FT misc_difference 132

FT WO9503831-A.
 PN 09-FEB-1995.
 PD 27-JUL-1994; U08511.
 PF 02-AUG-1993; US-099924.
 PR 29-OCT-1993; US-145829.
 PA (PRIZ-) WHITTIER PHARM INC.
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
 PI Baird AJ, Lappi DA, Sosnowski BA;
 DR WPI; 95-082038/11.
 DT New monogenous preparations of cytotoxic conjugates and DNA -
 PT contain fibroblast growth factors and cytotoxic agents for
 PT treating FGF conditions such as tumours, diabetes and rheumatoid
 PT arthritis.
 PS Disclosure: Page 108-109; 128pp; English.
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
 CC by conservative Ser substitutions. The fusion proteins are potent
 CC cytotoxic agents to cells bearing the FGF receptor.
 SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDQHIQLQLSAESYGEV 69
 : : : : :
 QY 55 SDDFELSGSGDANYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDQHIQLQLSAESYGEV 114

Db 70 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 129
 : : : : :
 QY 115 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 174

Db 130 GSKCRGPRTHYGOKAILFLPLPVSSD 155
 : : : : :
 QY 175 GSKCRGPRTHYGOKAILFLPLPVSSD 200

RESULT 12
 ID W92291 standard; Protein; 155 AA.
 AC W92291;
 DT 20-APR-1999 (first entry)
 DE Human endothelial cell growth factor (ECGF) protein sequence.
 KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
 OS regenerate; blood vessel; endothelial cell; human.
 PI Homo sapiens.
 PA Location/Qualifiers
 FT Peptide 2
 FT /note= "beta-ECGF begins at this position"
 FT Peptide 16
 FT /note= "acidic-FGF begins at this position"
 FT Peptide 22
 FT /note= "alpha-ECGF begins at this position"
 PN US5849538-A.
 PD 15-DEC-1998.
 PF 11-APR-1997; 840088.
 PR 04-NOV-1996; US-743261.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PR 11-APR-1997; US-840088.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 99-069734/06.
 DR N-PSDB; X01723.
 DT DNA encoding a cleavable signal peptide and an endothelial cell
 PT growth factor - useful for producing recombinant endothelial cell
 PT growth factor proteins
 PT Disclosure: Fig 8; 23pp; English.

CC The invention relates to DNA encoding human endothelial cell growth
 CC factors (ECGF) and plasmids comprising the DNA sequences. The DNA encodes
 CC a cleavable signal peptide and an ECGF, where removal of the signal
 CC peptide yields a mature form of the ECGF, where the ECGF is alpha-ECGF or
 CC beta-ECGF. The DNA is used to produce recombinant ECGF proteins, which
 CC can be used in treatments to repair or regenerate blood vessels or other
 CC structures lined with endothelial cells. The present sequence represents
 CC a human ECGF protein (the encoding cDNA determined from lambda ECGF
 CC clones 1 and 29).
 CC Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 69
 QY 55 SDDFELSGSDANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114

70 YIKSTETGOYAMDMDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKKN 129
 QY 115 YIKSTETGOYAMDMDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKKN 174

Db 130 GSKRGPRTHYGOKAILFLPLPVSSD 155
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 13
 ID R05785 standard; Protein; 165 AA.
 AC R05785;
 DT 22-AUG-1990 (first entry)
 DE Human bECGF encoded by synthetic gene.
 KW Beta-endothelial cell growth factor; homeostasis;
 KW atherosclerosis; tumor.
 OS Synthetic.
 FH Key Location/Qualifiers
 FT misc_difference 160..161
 FT /note= "sites corresp. to two stop codons of
 FT the DNA sequence"

PN GB2223497-A.
 PD 11-APR-1990.
 PF 08-AUG-1988; 018777.
 PR 08-AUG-1988; GB-018777.
 PA (BRI) Brit Bio-Tech Ltd.
 PI Davies JA, Johnson ID;
 DR WPI; 90-109883/15.
 N-PSDB; Q03871.
 CC Gene encoding human beta-endothelial cell growth factor -
 CC incorporates useful restriction sites at frequent intervals to
 CC facilitate cassette mutagenesis at selected regions.
 PS Disclosure; Fig 3a; 18pp; English.
 CC The synthetic bECGF gene incorporates useful restriction sites at
 CC frequent intervals to facilitate the cassette mutagenesis of
 CC selected regions. Also included are flanking sites to simplify
 CC the incorporation of the gene into any expression system.
 CC bECGF is one of the factors involved in the regulation of
 CC homeostasis of blood vessels acting in part through effects on
 CC endothelial cells. Such factors may also play a role in stages
 CC of atherosclerosis and tumour growth and development.
 CC Sequence 165 AA;

Query Match 68.5%; Score 985; DB 1; Length 165;
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 17 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 73
 QY 55 SDDFELSGSDANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114

Db 74 YIKSTETGOYAMDMDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKKN 133
 QY 115 YIKSTETGOYAMDMDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKKN 174

Db 134 GSKRGPRTHYGOKAILFLPLPVSSD 159
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 14
 ID W06818 standard; Protein; 168 AA.
 AC W06818;
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor.
 KW Endothelial cell growth factor; ECGF.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT protein 15..168
 FT /label= ECGF-beta
 FT protein 35..168
 FT /label= ECGF-alpha
 PN US5571790-A.
 PD 05-NOV-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 96-505421/50.
 N-PSDB; T45985.
 DT Recombinant human endothelial cell growth factors - for treating
 DT damaged blood vessels, etc.
 PS Example D; Fig 8; 22pp; English.
 CC Human endothelial cell growth factor (ECGF) is a mitogen for
 CC endothelial cells. Its amino acid sequence was deduced from a
 CC cDNA clone (T45985) isolated from a human brain stem library.
 CC Recombinant ECGF-beta (W06816) and ECGF-alpha (W06817) can be
 CC produced in transformed host cells. They have utility in the
 CC growth and amplification of endothelial cells in culture, and can
 CC potentially be used to treat damaged blood vessels and other
 CC endothelial cell-lined structures. They also have diagnostic
 CC applns.
 CC Sequence 168 AA;

Query Match 68.5%; Score 985; DB 1; Length 168;
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 26 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 82
 QY 55 SDDFELSGSDANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114

Db 83 YIKSTETGOYAMDMDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKKN 142
 QY 115 YIKSTETGOYAMDMDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKKN 174

Db 143 GSKRGPRTHYGOKAILFLPLPVSSD 168
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 15
 ID W75413 standard; protein; 134 AA.
 AC W75413;
 DT 02-MAR-1999 (first entry)
 DE Human alpha-endothelial cell growth factor.
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
 KW hybridisation; bovine; wound healing; prosthetic device.
 OS Homo sapiens.
 PN US5827826-A.
 PD 27-OCT-1998.
 PF 04-NOV-1996; 743261.

(TJ)

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    on: Tue Aug 29 15:55:40 2000; MasPar time 12.06 Seconds
    protein - protein database search, using Smith-Waterman algorithm
    782.316 Million cell updates/sec
    Regular output not generated.

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Scoring table: PAM 150
Gap 11

Searched: 142080 seqs, 47172406 residues

Database: pir64
1:pir1 2:pir2 3:pir3 4:pir4

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Result No.	Query		Length	DB	ID	Description	Pred. No.
	Score	Match					
1	985	68.5	155	1	A33665	acidic fibroblast gro	1.04e-19
2	967	67.2	155	1	A60721	acidic fibroblast gro	1.80e-19
3	966	67.2	155	2	D37360	acidic fibroblast gro	3.10e-19
4	966	67.2	155	2	S04147	acidic fibroblast gro	3.10e-19
5	954	66.3	152	2	JH0476	acidic fibroblast gro	2.06e-18
6	917	63.8	155	1	GKBOA	acidic fibroblast gro	1.01e-17
7	916	63.7	155	2	A60130	acidic fibroblast gro	1.74e-17
8	906	63.0	155	2	JW0055	fibroblast growth fac	3.86e-17
9	522	36.3	189	2	A48834	basic fibroblast grow	2.15e-88
10	516	35.9	146	1	S00185	basic fibroblast grow	4.89e-87
11	516	35.9	157	1	GKBOB	basic fibroblast grow	4.89e-87
12	509	35.4	210	2	D32398	basic fibroblast grow	1.86e-85
13	508	35.3	154	2	C37360	basic fibroblast grow	3.13e-85
14	508	35.3	154	2	A31674	basic fibroblast grow	3.13e-85
15	498	34.6	164	2	S31622	basic fibroblast grow	5.61e-83
16	493	34.3	155	1	A40117	basic fibroblast grow	7.48e-82
17	466	32.4	137	2	JC16711	fibroblast growth fac	8.54e-76
18	448	31.2	198	2	IC1457	ryudocan precursor	8.93e-72
19	350	24.3	208	2	A48137	fibroblast growth fac	3.15e-50
20	350	24.3	208	2	S66486	fibroblast growth fac	3.15e-50
21	329	22.9	207	2	JC5941	fibroblast growth fac	1.05e-45
22	324	22.5	207	2	D25940	fibroblast growth fac	1.24e-44
23	302	21.0	194	2	S49501	keratinocyte growth f	5.98e-40


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Db 130 GSCRGPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 175 GSCRGPRTHYGQKAILFLPLPVSSD 200

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999

ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DGF-1 cell aFGF/HBGF-I gene and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 67.2%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 1.80e-191;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
|||||

Db 81 AMDTDGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTDGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

Query Match 67.2%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 1.80e-191;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
|||||

Db 81 AMDTDGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTDGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change 16-Jul-1999

ACCESSIONS D37360; JC5231
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madiai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

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##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
#superfamily fibroblast growth factor
CLASSIFICATION #length 155 #molecular-weight 17417 #checksum 9341
SUMMARY

Query Match 67.2%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.10e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTDGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 16-Jul-1999

ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 67.2%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.10e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTDGLLYGSQTPNEECFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS      JH0476; S20072
REFERENCE        JH0476
#authors        Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal         Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title           Amplification and sequencing of mRNA encoding acidic
#               fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession       JH0476
#molecule_type mRNA
#residues        1-152 ##label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note            the hydrophobic core residues are packed around the
                internal symmetry axis
COMMENT          This protein belongs to the fibroblast growth factor family.
CLASSIFICATION  #superfamily fibroblast growth factor
KEYWORDS         growth factor; heparin binding
FEATURE          22-28
                133
                133
JMWARY          #region nuclear location signal\
                #binding site heparin (Lys) #status predicted
                #length 152 #checksum 1124

Query Match      66.3%; Score 954; DB 2; Length 152;
Best Local Similarity 91.6%; Pred. No. 2.06e-188;
Matches 131; Conservative 6; Mismatches 3; Indels 3; Gaps 2;

Db 13 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHLOQLSAESVGEV 69
QY 55 SDDFELSGSDGANNYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHLOQLSAESVGEV 114
Db 70 YKSTETGOYLANDTDGLLYGSGTSEECFLERLEENHNYTTSKHAENKWFVGLKKN 129
QY 115 YKSTETGOYLANDTDGLLYGSGTSEECFLERLEENHNYTTSKHAENKWFVGLKKN 174
Db 130 GSKRGPRTHYGQKAILFLPLV 152
QY 175 GSKRGPRTHYGQKAILFLPLV 197

RESULT          6
ENTRY           GRBOA #type complete
TITLE           acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
                factor I; prostatin
ORGANISM        #formal_name Bos primigenius taurus #common_name cattle
DATE            13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
                18-Jun-1999
CESSIONS        JH0613; S02102; S02065; B24663; A94281; S03953;
                A91010; A24477; B25043; C25043; A24539; A60884;
                A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE        JH0613
#authors        Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
                J.M.; Courtols, Y.; Laurent, M.
#journal         Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title           Heterogeneity of 3' untranslated region of bovine acidic FGF
                transcripts.
#cross-references MUID:92246990
#accession       JH0613
#molecule_type DNA
#residues        58-155 ##label REN
REFERENCE        S02102
#authors        Halley, C.; Courtols, Y.; Laurent, M.
#journal         Nucleic Acids Res. (1988) 16:10913
#title           Nucleotide sequence of bovine acidic fibroblast growth factor
                cDNA.
#cross-references MUID:89083506
#accession       S02102
#molecule_type mRNA
#residues        1-155 ##label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE        S02661
#authors        Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtols, Y.;

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Laurent, M.
FEBS Lett. (1988) 242:41-46
#title           Characterization of a bovine acidic FGF cDNA clone and its
                expression in brain and retina.
#cross-references MUID:89078619
#accession       S02661
#molecule_type mRNA
#residues        1-155 ##label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE        S22065
#authors        Philippe, J.M.
#journal         Submitted to the EMBL Data Library, May 1992
#title           #molecule_type mRNA
                #residues 1-18 ##label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE        A94290
#authors        Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
                J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal         Science (1986) 233:545-548
#title           Nucleotide sequence of a bovine clone encoding the angiogenic
                protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession       A94281
#molecule_type protein
#residues        62-102 ##label ABR
REFERENCE        A94281
#authors        Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
                M.; DiSalvo, J.; Thomas, K.
#journal         Science (1985) 230:1385-1388
#title           Brain-derived acidic fibroblast growth factor: complete amino
                acid sequence and homologies.
#cross-references MUID:86070224
#accession       A94281
#molecule_type protein
#residues        16-155 ##label GIM
REFERENCE        S03953
#authors        Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
                N.; Sharma, H.S.; Schaper, W.
#journal         Eur. J. Biochem. (1989) 181:67-73
#title           Isolation of heparin-binding growth factors from bovine,
                porcine and canine hearts.
#cross-references MUID:89231704
#accession       S03953
#molecule_type protein
#residues        16-45 ##label QUI
REFERENCE        A91010
#authors        Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal         EMBO J. (1985) 4:1951-1956
#title           Acidic fibroblast growth factor (FGF) from bovine brain:
                amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession       A91010
#molecule_type protein
#residues        16-30,'X',32-34,'X',36-44 ##label BOH
REFERENCE        A24477
#authors        Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
                G.D.; Bordoli, R.S.; McKeegan, W.L.
#journal         Biochemistry (1986) 25:4988-4993
#title           Complete primary structure of prostatin, a prostate
                epithelial cell growth factor.
#cross-references MUID:87026586
#accession       A24477
#molecule_type protein
#residues        2,'GE',5-155 ##label CRA
REFERENCE        A94127
#authors        Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
                Maciag, T.
#journal         Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title           Structural evidence that endothelial cell growth factor beta
                is the precursor of both endothelial cell growth factor
                alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor

REFERENCE
#authors
#journal
#title
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR
REFERENCE
#authors
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.;
Disalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of
brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO
REFERENCE
#authors
Kuo, M.D.; Huang, S.S.; Huang, J.S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine
liver is a novel protein tyrosine kinase.

#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30, 'X', 32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76, 'X', 78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form
designated as brain-derived growth factor B

REFERENCE
#authors
Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry,
I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class I heparin binding growth factor promotes the
differentiation but not the survival of ciliary neurones in
vivo.

#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26; 28-50; 53-110, 'H', 112, 'NTY'; 134-155 #label HIL
REFERENCE
#authors
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet,
J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine
acidic fibroblast growth factor by the single strand
ligation to single-stranded cDNA methodology.

#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
#accession A34477
#authors
Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
#journal J. Biol. Chem. (1989) 264:17606-17612
#title Purification of acidic fibroblast growth factor from bovine
heart and its localization in the cardiac myocytes.

#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24; 121-127; 134-143 #label SAS
#experimental_source heart
COMMENT The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT This protein binds heparin, although less strongly than does bFGF.
There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the pig
....
Note: remainder of annotations omitted.

Query Match 63.8% Score 917; DB 1; Length 155;
Best Local Similarity 91.9% Pred. No. 1.01e-179;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGYFLRLPDGTVDGTYDRSDQHQLQCAESIGEVIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTYDRSDQHQLQCAESIGEVIKSTETGQYL 125
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTDGLLYGQSPNPECLFLERLEENHYNTYISKHAKEHWFVGLKNGRSKLGPRTHF 140
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 126 AMDTDGLLYGQSPNPECLFLERLEENHYNTYISKHAKEHWFVGLKNGRSKLGPRTHY 185
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 186 GQKAILFLPLPVSSD 200
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 7
ENTRY #type complete
TITLE A60130 acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.

#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor.

#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY
Query Match 63.7%; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 1.74e-179;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 80
QY 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 125
Db 81 AMDTNGLLYGSOTPEECFLERLEENHYNTYISKHAEDKWNFVGLKNGSKLGPRTY 140
QY 126 AMDTGLLYGSOTPEECFLERLEENHYNTYISKHAEDKWNFVGLKNGSKLGPRTY 185
Db 141 GOKAILFLPLPVSSD 155
QY 186 GOKAILFLPLPVSSD 200

RESULT 8
ENTRY fibroblast growth factor-1 - sheep
TITLE fibroblast growth factor-1 - sheep
ALTERNATE_NAMES FGF-1
ORGANISM #formal_name Ovis sp. #common_name sheep
DATE 17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change 07-May-1999
ACCESSIONS JW0055
REFERENCE #authors Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.; Donjerovic, D.; Chang, H.; Yun, J.; Subramanian, R.; Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess, W.H.
#journal Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title Primary structure of ovine fibroblast growth factor-1 deduced by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues 1-155 #label GRI
COMMENT This protein is a potent mitogenic factor for NIH 3T3 fibroblasts in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17557 #checksum 8890
Query Match 63.0%; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 3.86e-177;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

QY 21 GNYKPKLLYCSNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 80
QY 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 125
Db 81 AMDTNGLLYGSOTPEECFLERLEENHYNTYISKHAEDKWNFVGLKNGSKLGPRTY 140
QY 126 AMDTGLLYGSOTPEECFLERLEENHYNTYISKHAEDKWNFVGLKNGSKLGPRTY 185
Db 141 GOKAILFLPLPVSSD 155
QY 186 GOKAILFLPLPVSSD 200

RESULT 9
ENTRY basic fibroblast growth factor - chicken
TITLE basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change 16-Jul-1999
ACCESSIONS A48834
REFERENCE #authors Borja, A.Z.; Meijers, C.; Zeller, R.
#journal Dev. Biol. (1993) 157:110-118
#title Expression of alternatively spliced bregf first coding exons and antisense mRNAs during chicken embryogenesis.
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#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note sequence extracted from NCBI backbone (NCBIN:131000, NCBIP:131001)

REFERENCE S23636
#authors Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:G62855; PIDN:CAA40139.1; PID:G62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 189 #molecular-weight 20312 #checksum 8538

Query Match 36.3%; Score 522; DB 2; Length 189;
Best Local Similarity 54.5%; Pred. No. 2.15e-88;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 58 GHFKDKPKLYCKNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 117
QY 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 125
Db 118 AMKEDGRLALKATECEFFERLESNNYTRYSRKYSYD--WYVALKRTGOYKPKPTGP 175
QY 126 AMDTGLLYGSOTPEECFLERLEENHYNTYISKHAEDKWNFVGLKNGSKLGPRTY 185
Db 176 GOKAILFLPLPVSS 189
QY 186 GOKAILFLPLPVSS 199

RESULT 10
ENTRY basic fibroblast growth factor - sheep
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostaticin
ORGANISM #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
ACCESSIONS S00185
REFERENCE #authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabra, L.J.; Nice, E.C.; Rubira, M.R.; Burgess, A.W.
#journal FEBS Lett. (1987) 224:128-132
#title Primary structure of ovine pituitary basic fibroblast growth factor.
#cross-references MUID:88055577
#accession S00185
#molecule_type protein
#residues 1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding; mitogen
FEATURE 18-22
SUMMARY #region heparin binding #status predicted\
107-110 #region heparin binding #status predicted
Query Match 35.9%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 4.89e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 15 GHFKDKPKLYCKNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 74
QY 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 125
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Db	75	AKKEDGRLLASKVTDCEFFERLENNNTVRSRKYs--SWYALKRTGYKLGPKTKGP	132
Qy <td>126</td> <td>AMDDTGLLYSGPTNEECFLERLEENHYNTYISKRAEKNFVGLKKNGSKCRGPRTHY</td> <td>185</td>	126	AMDDTGLLYSGPTNEECFLERLEENHYNTYISKRAEKNFVGLKKNGSKCRGPRTHY	185
Db	133	GOKAILFLPMSAKS	146
Qy <td>186</td> <td>GOKAILFLPLVSS</td> <td>199</td>	186	GOKAILFLPLVSS	199
RESULT	11		
ENTRY			
TITLE		basic fibroblast growth factor precursor - bovine (fragment)	
ALTERNATE_NAMES		bFGF; kidney-derived growth factor; prostatriptin	
ORGANISM		#formal_name Bos primigenius taurus #common_name cattle	
DATE		13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change 10-Sep-1999	
ACCESSIONS		A24663; A32878; A33784; A61550; A61551; A60310; A61094; A24633	
REFERENCE		A01386; A60316; A22054; A24819	
authors		A94290	
journal		Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.	
title		Science (1986) 233:545-548	
		Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.	
		#cross-references MUID:86261806	
		#accession A24663	
		#molecule_type mRNA	
		#residues 3-157 #label ABR	
		#cross-references GB:M13440; NID:g163049; PTDN:AAA30518.1; PID:g163050	
		#experimental_source pituitary gland	
		A90924	
REFERENCE			
authors		Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes, J.C.	
journal		Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668	
title		Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells.	
		#cross-references MUID:87217066	
		#accession A32878	
		#molecule_type mRNA	
		#residues 3-157 #label AB2	
REFERENCE			
authors		A33784	
journal		Miller, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel, N.R.; Deuel, T.F.	
title		Biochem. Biophys. Res. Commun. (1989) 165:1096-1103	
		A novel 17 KD heparin-binding growth factor (HBGF-8) in bovine uterus: purification and N-terminal amino acid sequence.	
		#cross-references MUID:90121211	
		#accession A33784	
		#molecule_type protein	
		#residues 1-14 #label MIL	
		#note demonstration of a possible alternative initiator or splice junction	
REFERENCE			
authors		A61550	
journal		Bertolini, J.; Hearn, M.T.W.	
title		Mol. Cell. Endocrinol. (1987) 51:187-199	
		Isolation, characterization and tissue localisation of an N-terminal-truncated variant of fibroblast growth factor.	
		#cross-references MUID:87247652	
		#accession A61550	
		#molecule_type protein	
		#residues 16-35 #label BER	
REFERENCE			
authors		A61551	
journal		Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.	
title		Mol. Cell. Endocrinol. (1987) 49:189-194	
		Isolation and partial characterization of basic fibroblast growth factor from bovine testis.	
		#cross-references MUID:87162856	
		#accession A61551	
		#molecule_type protein	
		#residues 27-35, 'X', 37-41 #label UE3	
		#experimental_source testes	
		#note this form appears to be identical to the renal form	

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CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen
FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
SUMMARY #length 157 #checksum 1115
Query Match 35.9%; Score 516; DB 1; Length 157;
Best Local Similarity 55.2%; Pred. No. 4.89e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 26 GHFDPKRLKCKNGFFLRIHPDGRVDGVREKSPHKLQLOAERGVSIVKVCANRYL 85
::: || || || || || || || || || || || || || || || || || || ||
Qy 66 ANYKKPKLLYCSNGHFRLPDGTVDTRSDQHTQLQLSAESVGEVIKSTETGQYL 125
|| || || || || || || || || || || || || || || || || || || ||
Db 86 AMKEDGRLLACKVTDECFERLESNNYVRSRKYTS--SWYVALKRTGQYKLGPKTGP 143
|| || || || || || || || || || || || || || || || || || || ||
Qy 126 AMDTDGLLYGQTPNEECFLERLEENHNYIISKHAEKNFVGLKKNKSGCKRGPRHY 185
|| || || || || || || || || || || || || || || || || || || ||
Db 144 GOKATLFLPMSAKS 157
|| || || || || || || || || || || || || || || || || || || ||
Qy 186 GOKATLFLPLPVS 199
|| || || || || || || || || || || || || || || || || || || ||
RESULT 12
ENTRY #type complete
TITLE basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS basic fibroblast growth factor, 18K form
ORGANISM #formal_name Homo sapiens #common_name man
DATE 31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
A32398; A61537; A26642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
SESSIONS
REFERENCE
#authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues 1-210 #label PRA
##cross-references GB:J04513; NID:g183083; PIDN:AAAS2531.1; PID:g459811
REFERENCE
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal Growth Factors (1991) 4:277-287
#title Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues 1-114 #label SH1
#note authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE
A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues 56-210 #label KUR
##cross-references GB:M27968; NID:g182562; PIDN:AAAS2448.1; PID:g182563
REFERENCE
A90924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE
S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE
A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX',86-88,'X',90-91,'X',93-95 #label SH3
#note experimental source C-Li21 hepatocellular carcinoma cell line
sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues 'XXX',19,'X',21-29 #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE
A33624
#authors Felge, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousins,
L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI
REFERENCE
A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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Db 141 GOKAILFLPMSAKS 154
QY 186 GOKAILFLPLPVSS 199

RESULT 14
ENTRY basic fibroblast growth factor precursor - rat
TITLE basic fibroblast growth factor precursor - rat
AUTHOR_NAMES BFGF
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE #formal_name Monodelphis domestica #sequence_revision 21-May-1990 #text_change 16-Jul-1999

ACCESSIONS A31674; S00876; S24309
REFERENCE A31674; S00876; S24309

#authors Shimazaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.; Cooksey, K.; Baird, A.; Ling, N.
#journal Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title Complementary DNA cloning and sequencing of rat ovarian basic fibroblast growth factor and tissue distribution study of its mRNA

#cross-references MUID:89061721
#accession A31674
#molecule_type mRNA
#residues 1-154 #label SHI
#cross-references GB:M22427; NID:g204285; PIDN:AAA41210.1; PID:g204286

REFERENCE S00876
#authors Kurokawa, T.; Seno, M.; Igarashi, K.
#journal Nucleic Acids Res. (1988) 16:5201
#title Nucleotide sequence of rat basic fibroblast growth factor cDNA

#cross-references MUID:88262516
#accession S00876
#molecule_type mRNA
#residues 1-154 #label KUR
#cross-references EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204

REFERENCE S24309
#authors El-Husseini, A.E.D.; Paterson, J.A.; Mval, Y.; Shiu, R.P.C.
#journal Biochim. Biophys. Acta (1992) 1131:314-316
#title PCR detection of the rat brain basic fibroblast growth factor (bFGF) mRNA containing a unique 3' untranslated region

#cross-references MUID:92329546
#accession S24309
#status preliminary; translation not shown
#molecule_type mRNA
#residues 35-154 #label ELH
#cross-references EMBL:X61697; NID:g56143; PIDN:CAA43863.1; PID:g56144

CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor
FEATURE
1-9 #domain signal sequence #status predicted #label SIG
10-154 #product basic fibroblast growth factor #status predicted #label MAT

SUMMARY #length 154 #molecular-weight 17139 #checksum 3026

Query Match 35.3%; Score 508; DB 2: Length 154;
Best Local Similarity 54.5%; Pred. No. 3.13e-85;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLYCKNGGFFLRHPDGRVDGVRKSDPHVQLQAEERGVSIVKGCANRYL 82
QY 66 ANYKKPLLYCSNGGHFLAILPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETGQYL 125

Db 83 ANKEDGRLLAKVTECEFFERLESNNNTYRSKYS--SWYVALKRTGQYKLGSKTGP 140
QY 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185

Db 141 GOKAILFLPMSAKS 154
QY 186 GOKAILFLPLPVSS 199

RESULT 15
ENTRY #type fragment
S31622

TITLE basic fibroblast growth factor - short-tailed opossum
(Monodelphis domestica) (fragment)
ORGANISM #formal_name Monodelphis domestica
DATE 20-Feb-1995 #sequence_revision 20-Feb-1995 #text_change 12-Apr-1995

ACCESSIONS S31622
REFERENCE S31622

#authors Kusewitt, D.F.; Sabourin, C.L.K.; Budge, C.L.; Ley, R.D.
#submission submitted to the EMBL Data Library, September 1992
#description Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica.

#accession S31622
#status preliminary
#molecule_type DNA
#residues 1-164 #label KUS
#cross-references EMBL:Z15154
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 164 #checksum 5156

Query Match 34.6%; Score 498; DB 2: Length 164;
Best Local Similarity 54.5%; Pred. No. 5.61e-83;
Matches 73; Conservative 22; Mismatches 37; Indels 2; Gaps 1;

Db 33 GHFKDPKRLYCKNGGFFLRHPDGRVDGVRKSDPHVQLQAEERGVSIVKGCANRYL 92
QY 66 ANYKKPLLYCSNGGHFLAILPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETGQYL 125

Db 93 ANKEDGRLLAKVTECEFFERLESNNNTYRSKYS--NWYVALKRTGQYKLGSKTGP 150
QY 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185

Db 151 GOKAILFLPMSAKS 164
QY 186 GOKAILFLPLPVSS 199

Search completed: Tue Aug 29 15:55:58 2000
Job time : 18 secs.

MPSrch_pp protein - protein database search, using Smith-Waterman algorithm
(TM)

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on: Tue Aug 29 15:53:11 2000; MasPar time 7.86 seconds
Tabular output not generated. 788.874 Million cell updates/sec

Title: >US-09-121-017B-19
Description: (1-200) from US09121017B.pep
Perfect Score: 1438
Sequence: 1 MAPARLFAALLFFVGVGVAES.....PRTHYGKAILFLPLPVSSD 200

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: swiss-prot38
I:swissprot

Statistics: Mean 45.099; Variance 70.202; scale 0.642

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	68.5	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 1.14e-221
2	967	67.2	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 7.15e-217
3	966	67.2	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 1.32e-216
4	954	66.3	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH 2.07e-213
5	917	63.8	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 1.45e-203
6	916	63.7	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 2.66e-203
7	522	36.3	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 3.42e-100
8	516	35.9	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 1.17e-98
9	516	35.9	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 1.17e-98
10	509	35.4	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 7.18e-97
11	508	35.3	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 1.29e-96
12	508	35.3	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 1.29e-96
13	498	34.6	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 4.58e-94
14	493	34.3	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 8.58e-93
15	466	32.4	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 6.09e-86
16	448	31.2	198	1	SDCA_HUMAN	SYNDECAN-4 PRECURSOR (2.14e-81
17	360	25.0	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR 1.72e-59
18	350	24.3	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR 4.85e-57
19	350	24.3	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR 4.85e-57
20	350	24.3	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR 4.85e-57
21	329	22.9	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT 6.26e-52
22	324	22.5	207	1	FGFG_RAT	FIBROBLAST GROWTH FACT 1.01e-50
23	302	21.0	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA 1.97e-45

24	299	20.8	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA 1.03e-44
25	295	20.5	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA 9.22e-44
26	294	20.4	202	1	SDCA_RAT	SYNDECAN-4 PRECURSOR (1.59e-43
27	288	20.0	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT 4.24e-42
28	279	19.4	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT 5.69e-40
29	279	19.4	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 1.69e-39
30	277	19.3	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT 1.69e-39
31	277	19.3	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT 1.69e-39
32	276	19.2	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT 2.90e-39
33	275	19.1	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT 4.98e-39
34	274	19.1	247	1	FGFE_MOUSE	FIBROBLAST GROWTH FACT 8.55e-39
35	273	19.0	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT 1.47e-38
36	273	19.0	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT 1.47e-38
37	271	18.8	194	1	FGF7_RAT	KERATINOCYTE GROWTH FA 4.33e-38
38	269	18.7	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT 1.27e-37
39	266	18.5	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT 6.41e-37
40	266	18.5	256	1	FGF3_BRARE	FIBROBLAST GROWTH FACT 6.41e-37
41	263	18.3	225	1	FGFB_HUMAN	FIBROBLAST GROWTH FACT 3.21e-36
42	261	18.2	198	1	SDCA_MOUSE	SYNDECAN-4 PRECURSOR (9.39e-36
43	257	17.9	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT 7.99e-35
44	256	17.8	206	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT 1.36e-34
45	256	17.8	243	1	FGFC_HUMAN	FIBROBLAST GROWTH FACT 1.36e-34

ALIGNMENTS

RESULT 1
ID FGF1_HUMAN STANDARD; PRT; 155 AA.
AC P05230; P07502;
DT 13-AUG-1987 (Rel. 05, Created)
DT 13-AUG-1987 (Rel. 05, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).
DE BETA).
GN FGF1 OR FGFA.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Homnidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 86261805.
RA Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., MacIag T., Drohan W.N.;
RA "Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.";
RT Science 233:541-545(1986).
RN [2]
RP SEQUENCE FROM N.A.
RX TISSUE-BRAIN STEM;
RC MEDLINE; 89343957.
RA Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;
RA "Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues.";
RN Mol. Cell. Biol. 9:2387-2395(1989).
RN [3]
RP SEQUENCE FROM N.A.
RX TISSUE-BRAIN STEM;
RC MEDLINE; 90265618.
RA Chiu I.M., Wang W.P., Lehtoma K.;
RA "Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.";
RN Oncogene 5:755-762(1990).
RN [4]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90073637.
RA Mergia A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;
RA "Structural analysis of the gene for human acidic fibroblast growth factor.";
RT Biochem. Biophys. Res. Commun. 164:1121-1129(1989).
RN [5]
RP SEQUENCE FROM N.A.

RX MEDLINE: 92019819.
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;
RT "Cloning and sequence analysis of the human acidic fibroblast growth
RL factor gene and its preservation in leukemia patients.";
RN Oncogene 6:1521-1529(1991).
RX [6]
RP SEQUENCE FROM N.A.
RX MEDLINE: 92202857.
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,
RA Turk E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist.";
RL J. Exp. Med. 175:1073-1080(1992).
RX [7]
RP SEQUENCE OF 1-154 FROM N.A.
RX MEDLINE: 94069734.
RA Zhao X.M., Yeh T.K., Hiebert M., Frist W.H., Miller G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RL cells";
RN Transplantation 56:1177-1182(1993).
RX [8]
RP SEQUENCE OF 1-40 FROM N.A.
RX MEDLINE: 90365758.
RA Crumley G., Dionne C.A., Jaye M.;
RT "The gene for human acidic fibroblast growth factor encodes two
RT upstream exons alternatively spliced to the first coding exon.";
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).
RX [9]
RP SEQUENCE OF 16-155.
RX MEDLINE: 86296647.
RA Harper J.W., Striydom D.J., Lobb R.R.;
RT "Human class I heparin-binding growth factor: structure and homology
RT to bovine acidic brain fibroblast growth factor.";
RL Biochemistry 25:4097-4103(1986).
RX [10]
RP SEQUENCE OF 16-155.
RX MEDLINE: 86295741.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "The complete amino acid sequence of human brain-derived acidic
RT fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).
RX [11]
RP SEQUENCE OF 16-155.
RX MEDLINE: 87048871.
RA Gautschi-Sova P., Mueller T., Boehlen P.;
RT "Amino acid sequence of human acidic fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).
RX [12]
RP SEQUENCE OF 16-47.
RX MEDLINE: 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
RT amino terminal sequences and specific mitogenic activities.";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
RX [13]
RP SEQUENCE OF 16-49.
RX MEDLINE: 86275260.
RA Gautschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
RT human brain: acidic and basic fibroblast growth factors.";
RL FEBS Lett. 204:203-207(1986).
RX [14]
RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
RA Blaber M., Disalvo J., Thomas K.A.;
RT "X-ray crystal structure of human acidic fibroblast growth factor.";
RL Biochemistry 35:2086-2094(1996).
RX [15]
RP STRUCTURE BY NMR OF 24-155.
RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,
RA Gimenez-Gallego G.;
RT "1H-NMR assignment and solution structure of human acidic fibroblast
RT growth factor activated by inositol hexasulfate.";
RN J. Mol. Biol. 242:81-98(1994).
RX [16]
RP STRUCTURE BY NMR OF 24-155.
RX MEDLINE: 97107535.
RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
RA Rico M., Gimenez-Gallego G.;
RT "Three-dimensional structure of acidic fibroblast growth factor in
RT solution: effects of binding to a heparin functional analog.";
RN J. Mol. Biol. 264:162-178(1996).
RX [17]
RP STRUCTURE BY NMR OF 25-155.
RX MEDLINE: 98387896.
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral
RT action of suramin and suradistas.";
RN J. Mol. Biol. 281:899-915(1998).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES BFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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CC or send an email to license@isb-sib.ch).
CC -----
DR EMBL: M13361; AAA79245.1; -
DR EMBL: X51943; CAA36206.1; -
DR EMBL: M30492; AAA52446.1; -
DR EMBL: M30490; AAA52446.1; JOINED.
DR EMBL: M30491; AAA52446.1; JOINED.
DR EMBL: M60515; AAA51672.1; -
DR EMBL: M60516; AAA51673.1; -
DR EMBL: M23087; AAA52638.1; -
DR EMBL: M23086; AAA52638.1; JOINED.
DR EMBL: M67291; AAB29057.1; -
DR EMBL: X65778; CAA46661.1; -
DR PIR: A23553; A23553.
DR PIR: A24243; A24243.
DR PIR: A24301; A24301.
DR PIR: A24682; A24682.
DR PIR: A24820; A24820.
DR PIR: A26386; A26386.
DR PIR: A33665; A33665.
DR PIR: S18217; S18217.
DR PDB: 2AFG; 15-OCT-95.
DR PDB: 1AXM; 22-APR-98.
DR PDB: 2AXM; 22-APR-98.
DR PDB: 1RML; 11-NOV-98.
DR MIM: 131220; -
DR PFAM: PF00167; FGF; 1.
DR PRINTS: PR00262; ILIHHGF.
DR PRINTS: PR00263; HBGFFGF.
DR PROSITE: PS00247; HBGFLFGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
KW 3D-structure.
FT PROPEP 1 15
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
FT MOD_RES 2 2 ACETYLATION
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17460 MW; F586E8BF09F1580 CRC64;

Query Match 68.5%; Score 985; DB 1; Length 155;
Best Local Similarity 93.8%; Pred. No. 1.14e-221;
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TERENLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDSRDOHQIQLSASVGEV 69
QY 55 SDFELSGSDGANYKKPKLLYCSNGGHLRLPDGTVDGTRDSRDOHQIQLSASVGEV 114
Db 70 YIKSTFGQVLAAMDGLLYGSGTNPNECLFLERLEENHYNTYISKKAENWFGVGLKKN 129
QY 115 YIKSTFGQVLAAMDGLLYGSGTNPNECLFLERLEENHYNTYISKKAENWFGVGLKKN 174
Db 130 GSKRGPRTHYGKAILFLPLPVSSD 155
QY 175 GSKRGPRTHYGKAILFLPLPVSSD 200

RESULT 2 STANDARD; PRT; 155 AA.
ID FGF1_MOUSE
AC P10935;
DT 01-JUL-1989 (Rel. 11, Created)
DT 01-JUL-1989 (Rel. 11, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF).
GN FGF1 OR FGF-1 OR FGFA.
OS Mus musculus (Mouse), and Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC SPECIES-RAT;
RX MEDLINE; 89240051.
RA Goodrich S., Van G.C., Bahrenburg K., Mansson P.E.;
RT "The nucleotide sequence of rat heparin binding growth factor 1
RT (HBGF-1).";
RL Nucleic Acids Res. 17:2867-2867(1989).
RN [2]
RP SEQUENCE FROM N.A.
RC SPECIES-MOUSE;
RX MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
RN [3]
RP SEQUENCE FROM N.A.
RC SPECIES-MOUSE;
RX MEDLINE; 97128312.
RA Madiai F., Hackshaw K.V., Chiu I.M.;
RT "Cloning and characterization of the mouse Fgf-1 gene.";
RL Gene 179:231-236(1996).
RN [4]
RP SEQUENCE FROM N.A.
RC SPECIES-MOUSE; STRAIN=BALB/C;
RX MEDLINE; 97094746.
RA Alam K.Y., Frosthalm A., Hackshaw K.V., Evans J.E., Rotter A.,
RT Chiu I.M.;
RT "Characterization of the 1B promoter of fibroblast growth factor 1
RT and its expression in the adult and developing mouse brain.";
RL J. Biol. Chem. 271:30263-30271(1996)
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL; X14232; CAA32448.1;
DR EMBL; M30641; AAA37618.1;
DR EMBL; U36459; AAC52969.1;
DR EMBL; U36457; AAC52969.1; JOINED.
DR EMBL; U36458; AAC52969.1; JOINED.
DR EMBL; U67610; AAC52907.1;
DR PIR; S04147; SC4147.
DR PIR; D37360; D37360.
DR HSSP; P05230; 2AXM.
DR MGD; MGI:95515; FGF1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.

Query Match 67.2%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 7.13e-217;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHLRLPDGTVDGTRDSRDOHQIQLSASAGEVIKGTQOYL 80
QY 66 ANYKKPKLLYCSNGGHLRLPDGTVDGTRDSRDOHQIQLSASAGEVIKGTQOYL 125
Db 81 AMDTDGLYSGTNPNECLFLERLEENHYNTYISKKAENWFGVGLKKNCKRGPRTHY 140
QY 126 AMDTDGLYSGTNPNECLFLERLEENHYNTYISKKAENWFGVGLKKNCKRGPRTHY 185
Db 141 GQKAILFLPLPVSSD 155
QY 186 GQKAILFLPLPVSSD 200

DR	PIR; S03954; S03954.
DR	HSP; P05230; 2AXX.
DR	PFAM; PF00167; FGF; 1.
DR	PROSITE; PS00247; HBGF_FGF; 1.
KW	Growth factor; Mitogen; Vascularization; Heparin-binding.
FT	PROPEP 1 15
FT	CHAIN 16 >152
FT	CHAIN 22 >152
FT	BINDING 24 28
FT	BINDING 113 116
FT	CONFLICT 31 31
FT	CONFLICT 39 39
FT	NON_TER 152 152
SQ	SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match		66.3%; Score 954; DB 1; Length 152;
Best Local Similarity 91.8%; Pred.No. 2.07e-213;		
Matches	131; Conservative	6; Mismatches 3; Indels 3; Gaps

Db	13	TEKFNLPG-NYKKPKLLYCNSGHHFLRLPDGVGTGRDSQHIQLLSAESVGEV 69
	:	: : : :
QY	55	SDDFELSGSDANYKPKLLYCNSGHHFLRLPDGVGTGRDSQHIQLLSAESVGEV 114
Db	70	YIKSTGTQVLAMDTGLLYGSOTPSSECLFLERLEENHYNYTSKKHAEKNWFVGLKKN 129
	:	: : : :
QY	115	YIKSTGTQVLAMDTGLLYGSOTPNEECLFLERLEENHYNTYSKKHAEKNWFVGLKKN 174
Db	130	GSCKRGRTHYGOKAILFLPLPV 152
	:	: : : :
QY	175	GSCKRGRTHYGOKAILFLPLPV 197

RESULT	5
ID	FGF1_BOVIN STANDARD; PRT; 155 AA.
AC	P03968;
DT	23-OCT-1986 (Rel. 02, Created)
DT	01-MAR-1989 (Rel. 10, Last sequence update)
DT	15-JUL-1999 (Rel. 38, Last annotation update)
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF II).
GN	FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
OS	Bos taurus (Bovine).
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC	Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC	Bovidae; Bovinae; Bos.
RN	[1]
RP	SEQUENCE FROM N.A.
RC	TISSUE=RETINA;
RC	MEDLINE; 89083506.
RA	Halley C., Courtois Y., Laurent M.;
RL	"Nucleotide sequence of bovine acidic fibroblast growth factor cDNA." [2]
RL	Nucleic Acids Res. 16:10913-10913(1988).
RN	[2]
RP	SEQUENCE FROM N.A.
RC	TISSUE=RETINA;
RC	MEDLINE; 89078619.
RA	Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
RL	"Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina." [3]
RL	FEBS Lett. 242:41-46(1988).
RN	[3]
RP	SEQUENCE OF 2-155.
RC	MEDLINE; 87016918.
RA	Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
RL	"Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor." [4]
RL	Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
RN	[4]
RP	SEQUENCE OF 2-155.
RC	MEDLINE; 87026586.

RA Crabb J.A., Armes L.G., Carr S.A., Johnson C.M., Roberts G.D.,
 RA Bordoli F.S., McKeehan W.L.;
 RT "Complete primary structure of prostastropin, a prostate epithelial
 RT cell growth factor";
 RL Biochemistry 25:4988-4993(1986).
 RN [5]
 RP SEQUENCE OF 16-155.
 RX MEDLINE; 86070224.
 RA Gimenez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,
 RA Disalvo J., Thomas K.;
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid
 RT sequence and homologies";
 RL Science 235:1385-1388(1985).
 RN [6]
 RP SEQUENCE OF 16-44, AND COMPOSITION.
 RX MEDLINE; 86055750.
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:
 RT amino-terminal sequence and comparison with basic FGF";
 RL EMBO J. 4:1951-1956(1985).
 RN [7]
 RP SEQUENCE OF 16-56 FROM N.A.
 RX MEDLINE; 86261806.
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,
 RA Hjerrild K.A., Gospodarowicz D., Fiddes J.C.;
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic
 RT protein, basic fibroblast growth factor";
 RL Science 233:545-548(1986).
 RN [8]
 RP SEQUENCE OF 16 45.
 RX MEDLINE; 89231704.
 RA Quinkler W., Matusberg M., Bernotat-Danielowski S., Luethe N.,
 RA Sharma H.S., Schaper W.;
 RT "Isolation of heparin-binding growth factors from bovine, porcine and
 RT canine hearts";
 RL Eur. J. Biochem. 181:67-73(1989).
 RN [9]
 RP SEQUENCE OF 1-18 FROM N.A.
 RX MEDLINE; 91095983.
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RA Hsu B.T., Rees D.C.;
 RT "Three-dimensional structures of acidic and basic fibroblast growth
 RT factors";
 RL Science 251:90-93(1991).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BEGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 CC EMBL; M13439; AAA30516.1;
 CC EMBL; X13221; CAA31610.1;
 CC EMBL; X14032; CAA32192.1;
 CC EMBL; M35608; AAA30517.1;
 CC EMBL; X66446; CAA47063.1;
 CC EMBL; M97660; AAA30563.1;
 CC EMBL; M97661; AAA30564.1;
 CC PIR; A01385; GKBOA.

DR PIR; A25043; A25043.
 DR PIR; B25043; B25043.
 DR PIR; C25043; C25043.
 DR PIR; A24477; A24477.
 DR PIR; B24663; B24663.
 DR PIR; S02102; S02102.
 DR PDB; IBAR; 31-OCT-93.
 DR PDB; IAF; 31-OCT-93.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGFEGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 KW 3D-structure.
 FT PROPEP 1 15
 FT CHAIN 2 155
 FT CHAIN 16 155
 FT CHAIN 22 155
 FT MOD_RES 2 2
 FT BINDING 24 28
 FT BINDING 113 116
 FT STRAND 27 31
 FT STRAND 32 34
 FT STRAND 37 40
 FT TURN 42 43
 FT STRAND 46 49
 FT HELIX 55 57
 FT STRAND 59 61
 FT STRAND 69 69
 FT STRAND 71 73
 FT STRAND 79 82
 FT TURN 84 85
 FT STRAND 87 91
 FT HELIX 96 98
 FT STRAND 100 100
 FT STRAND 103 104
 FT TURN 106 107
 FT STRAND 110 111
 FT STRAND 113 114
 FT TURN 116 121
 FT STRAND 123 123
 FT STRAND 126 126
 FT TURN 128 129
 FT STRAND 132 132
 FT STRAND 134 134
 FT STRAND 135 137
 FT HELIX 140 141
 FT TURN 144 145
 FT STRAND 147 150
 SQ SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;
 Query Match 63.88; Score 917; DB 1; Length 155;
 Best Local Similarity 91.9%; Pred. No. 1.45e-203;
 Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;
 Db 21 GNKKPKLLYCSNGVFLRILPDGTVDGDKDRSDQHQIQCAESIGEVYIKSTGQFL 80
 QY 66 ANKKPKLLYCSNGVFLRILPDGTVDGDKDRSDQHQIQCAESIGEVYIKSTGQYL 125
 Db 81 AMTDGLLYGSGTPNECLFLERLEENHYNTYISKKAHKHMFVGLKNGSKLGPRTHF 140
 QY 126 AMTDGLLYGSGTPNECLFLERLEENHYNTYISKKAHKHMFVGLKNGSKRG RTHY 185
 Db 141 GQKAILFLPLVSSD 155
 QY 186 GQKAILFLPLVSSD 200
 RESULT 6
 ID FGFL_CHICK STANDARD; PRT; 155 AA.
 AC P19596;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)

15-JUL-1999 (Rel. 38, Last annotation update)
HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR).
GN FGF1 OR FGF-1.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
OC Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 91347925.
RA Schnurch H., Risau W.;
RT "Differentiating and mature neurons express the acidic fibroblast
RT growth factor gene during chick neural development.";
RL Development 111:1143-1154(1991).
RN [2]
RP SEQUENCE FROM N.A.
RA Martin G.R., Han J.K.;
RL Submitted (JUL-1995) to the EMBL/GenBank/DBJ databases.
RN [3]
RP SEQUENCE OF 22-48.
RX MEDLINE; 88296438.
RA Risau W., Gautschi-Sova P., Boehlen P.;
RT "Endothelial cell growth factors in embryonic and adult chick brain
RT are related to human acidic fibroblast growth factor.";
RL EMBO J. 7:959-962(1988).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES BFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
CC EMBL; S63263; AAB19629.1; -;
CC DR EMBL; U31863; AAB80310.1; -;
CC DR EMBL; S63261; AAD13942.1; -;
CC DR FIR; S02633; S02639.
CC DR HSP; P05230; 2AXM.
CC DR PFAM; PF00167; FGF; 1.
CC PRINTS; P00262; ILHGBGF.
CC PRINTS; P00263; HGFEGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
CC Growth factor; Mitogen; Vascularization; Heparin-binding.
CC PROPEP 1 15
CC FT CHAIN 16 155
CC FT CHAIN 22 155
CC FT BINDING 24 28
CC FT BINDING 113 116
CC SEQUENCE 155 AA; 17322 MW; 8EDB70545E2B4365 CRC64;
Query Match 63.7%; Score 916; DB 1; Length 155;
Best Local Similarity 90.4%; Pred. No. 2.66e+203;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;
Db 21 GNYPKLLYCSNGHFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 80
QY 66 ANYKPKLLYCSNGHFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 125
Db 81 AMDTGLLYGSQLPCECLFLERLEENHYNTYISKHADKNWVGLKNGSKLGPRTYH 140
QY 126 AMDTGLLYGSQLPCECLFLERLEENHYNTYISKHADKNWVGLKNGSKLGPRTYH 185
Db 141 GQAILFLPLPSAD 155

|||||
QY 186 GQAILFLPLPVSAD 200
RESULT 7
ID FGF2_CHICK STANDARD; PRT; 158 AA.
AC P48800;
DT 01-FEB-1996 (Rel. 33, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF).
GN FGF2 OR FGF-2.
OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
OC Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 93246053.
RA Borja A.Z., Zeller R., Meijers C.;
RT "Expression of alternatively spliced BFGF first coding exons and
RT antisense mRNAs during chicken embryogenesis.";
RL Dev. Biol. 157:110-118(1993).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC -----
CC EMBL; M95707; AAA48617.1; -;
CC DR HSP; P09038; 1BFF.
CC DR PFAM; PF00167; FGF; 1.
CC PRINTS; P00262; ILHGBGF.
CC PRINTS; P00263; HGFEGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
CC Growth factor; Mitogen; Vascularization; Heparin-binding.
CC PROPEP 1 12
CC FT CHAIN 13 158
CC FT BINDING 30 34
CC FT BINDING 119 122
CC SEQUENCE 158 AA; 17374 MW; 7B69B684C1F1816 CRC64;
Query Match 36.3%; Score 522; DB 1; Length 158;
Best Local Similarity 54.5%; Pred. No. 3.42e+100;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 27 GHFKDPRKLYCKNGHFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 86
QY 66 ANYKPKLLYCSNGHFLRILPDGKVDGTRDSQHIQLQLSAEDVGEVYIKSTASGOYL 125
Db 87 AMKEDGRLALKATECEFFERLESNNYTSRKYSD--WYVALKRTGQYKPGKPTGP 144
QY 126 AMDTGLLYGSQLPCECLFLERLEENHYNTYISKHADKNWVGLKNGSKLGPRTYH 185
Db 145 GQAILFLPLPSAKS 158
QY 186 GQAILFLPLPVS 199
RESULT 8
ID FGF2_SHEEP STANDARD; PRT; 155 AA.

VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.

- SUBUNIT: MONOMER.

- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.

- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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EMBL: M13440; AAX30518.1; .

PIR: A24663; GKBOB.

PIR: A24819; A24819.

PIR: A32878; A32878.

PDB: 1BAS; 31-OCT-93.

PFAM: PF00167; FGF_1.

PRINTS: PR00262; ILHBBF.

PRINTS: PR00263; HBGF_FGF.

PROSITE: PS00247; HBGF_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding; 3D-structure.

FT PROPEP 1 9

FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.

FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.

FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).

FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).

FT BINDING 27 31 HEPARIN (POTENTIAL).

FT BINDING 116 119 HEPARIN (POTENTIAL).

FT STRAND 30 34

FT TURN 35 38

FT STRAND 39 43

FT TURN 45 46

FT STRAND 49 52

FT TURN 55 56

FT HELIX 58 60

FT STRAND 62 68

FT TURN 69 70

FT STRAND 71 76

FT TURN 77 80

FT STRAND 81 85

FT TURN 87 88

FT STRAND 91 94

FT HELIX 99 101

FT STRAND 103 107

FT TURN 109 110

FT STRAND 113 117

FT TURN 121 122

FT STRAND 124 124

FT TURN 127 127

FT STRAND 129 130

FT STRAND 133 133

FT HELIX 136 138

FT TURN 141 142

FT HELIX 144 146

FT STRAND 148 151

SQ SEQUENCE 155 AA; BE6CE70FA6107129 CRC64;

Query Match 35.9%; Score 516; DB 1; Length 155;

Best Local Similarity 55.2%; Pred. No. 1.17e-98;

Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

DB 24 GHFKDKPKRYKNGGFFLRHPDGRVDGVRKSDPHIKLQLOAEERGVYSIKGVCANRYL 83

QY 66 ANYKKPKLLYCSNGGHEFLRLPDGTVDTGTRDSQHQIQLSAESVGEVYIKSTETGOYL 125

DB 84 AMKEDGRLLASCVTDECFERLENNVNTYRSKYS--SWYVALKRTGQYKLGPKTGP 141

QY 126 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185

DB 142 GOKAILFLPMSAKS 155

QY 186 GOKAILFLPVS 199

RESULT 10

ID FGF2 HUMAN STANDARD; PRT; 155 AA.

AC P05038;

DT 01-NOV-1988 (Rel. 09, Created)

DT 01-NOV-1988 (Rel. 09, Last sequence update)

DT 01-NOV-1997 (Rel. 35, Last annotation update)

DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).

DE FGF2 OR FGFb.

GN Homo sapiens (Human).

OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

OC [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87053817.

RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J., Gospodarowicz D., Fiddes J.C.;

RA "Human basic fibroblast growth factor: nucleotide sequence and genomic organization."

RT genomic organization."

RL EMBO J. 5:2523-2528(1986).

RN [2]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87217066.

RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;

RA "Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells."

RT Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).

RN [3]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87213238.

RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M., Rifkin D.B.;

RA "A form of human basic fibroblast growth factor with an extended amino terminus."

RT Biochem. Biophys. Res. Commun. 144:543-550(1987).

RN [4]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87162468.

RA Kurokawa T., Sasada R., Igarashi K.;

RT "Cloning and expression of cDNA encoding human basic fibroblast growth factor."

RL FEBS Lett. 213:189-194(1987).

RN [5]

RP SEQUENCE FROM N.A.

RX MEDLINE; 89184522.

RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M., Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A., Caput D.;

RT "High molecular mass forms of basic fibroblast growth factor are initiated by alternative CUG codons."

RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).

RN [6]

RP SEQUENCE OF 10-35.

RX MEDLINE; 86275260.

RA Gautschi P., Frater-Schroeder M., Boehlen P.;

RT "Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors."

RL FEBS Lett. 204:203-207(1986).

RN [7]

RP SEQUENCE OF 10-39.

RX MEDLINE; 86186784.

RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;

RT "Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities."

RL Biochem. Biophys. Res. Commun. 135:541-548(1986).

RN [8]

RP SEQUENCE OF 2-22.

RX MEDLINE; 87156686.
 RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;
 RT "Amino-terminal sequence of a large form of basic fibroblast growth
 RL factor isolated from human benign prostatic hyperplastic tissue.";
 RN Biochem. Biophys. Res. Commun. 142:702-709(1987).
 RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
 RX MEDLINE; 91195367.
 RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;
 RT "Three-dimensional structure of human basic fibroblast growth
 RL factor.";
 RN Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
 RX MEDLINE; 94004464.
 RA Eriksson A.E., Cousens L.S., Matthews B.W.;
 RT "Refinement of the structure of human basic fibroblast growth factor
 RL at 1.6-A resolution and analysis of presumed heparin binding sites by
 RN selenate substitution.";
 RP Protein Sci. 2:1274-1284(1993).
 RX X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).
 RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;
 RT "Three-dimensional structure of human basic fibroblast growth factor,
 RL a structural homolog of interleukin 1 beta.";
 RN Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
 RX MEDLINE; 92121151.
 RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;
 RT "Crystal structure of basic fibroblast growth factor at 1.6-A
 RL resolution.";
 RN J. Biochem. 110:360-363(1991).
 RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).
 RX MEDLINE; 91095983.
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RT Hsu B.T., Rees D.C.;
 RL "Three-dimensional structures of acidic and basic fibroblast growth
 factors.";
 RN Science 251:90-93(1991).
 RP STRUCTURE BY NMR.
 RX MEDLINE; 97040521.
 RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;
 RT "High-resolution solution structure of basic fibroblast growth factor
 RL determined by multidimensional heteronuclear magnetic resonance
 spectroscopy.";
 RN Biochemistry 35:13552-13561(1996).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 DR EMBL; M17599; AAA52534.1; ALT_INIT.
 DR EMBL; X04431; CAA28027.1; -.
 DR EMBL; X04432; CAA28028.1; -.
 DR EMBL; X04433; CAA28029.1; -.
 DR EMBL; M27968; AAA52448.1; -.
 DR EMBL; J04513; AAA52533.1; ALT_INIT.

DR PIR; A25824; A25824.
 DR PIR; A26642; A26642.
 DR PIR; B24243; B24243.
 DR PIR; B24301; B24301.
 DR PIR; B32878; B32878.
 DR PIR; S00297; S00297.
 DR PDB; 2FGF; 15-APR-92.
 DR PDB; 4FGF; 15-JUL-93.
 DR PDB; 1FGA; 15-JUL-93.
 DR PDB; 1BFA; 03-APR-96.
 DR PDB; 1BFC; 03-APR-96.
 DR PDB; 1BFE; 16-JUN-97.
 DR PDB; 1BFG; 31-JAN-94.
 DR PDB; 2BFG; 30-APR-94.
 DR PDB; 1BLA; 08-NOV-96.
 DR PDB; 1BLD; 08-NOV-96.
 DR MIM; 134920; -.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PRO0262; ILIHGFGF.
 DR PRINTS; PRO0263; HBGFGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding;
 KW 3D-structure.
 FT PROPEP 1 9
 FT CHAIN 10 155
 FT SITE 46 48
 FT SITE 88 90
 FT BINDING 27 31
 FT BINDING 116 119
 FT STRAND 30 34
 FT TURN 35 38
 FT STRAND 39 43
 FT TURN 45 46
 FT STRAND 49 52
 FT TURN 55 56
 FT HELIX 58 60
 FT STRAND 62 66
 FT TURN 69 70
 FT STRAND 71 76
 FT TURN 77 80
 FT STRAND 81 85
 FT TURN 87 88
 FT STRAND 91 94
 FT HELIX 99 101
 FT STRAND 103 107
 FT TURN 109 110
 FT STRAND 113 117
 FT TURN 121 122
 FT STRAND 124 124
 FT STRAND 127 127
 FT TURN 129 130
 FT STRAND 132 133
 FT STRAND 136 138
 FT TURN 141 142
 FT HELIX 144 146
 FT STRAND 148 152
 SQ SEQUENCE 155 AA; 17254 MW; BE6CE13373007129 CRC64;
 Query Match 35.4%; Score 509; DB 1; Length 155;
 Best Local Similarity 54.5%; Pred. No. 7.18e-97;
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
 Db 24 GHFDKRLKCKNGGFFLRTHPDGRVDGVRKSDPHIKLQLOAERGVSIGKVCANRYL 83
 Qy 66 ANYKKPLLYCSNGHGFLRLPDGTVDGTRSDQHQLOLSAESVGEVIKTKETGOYL 125
 Db 84 AMKEDGRLLASCKVTDCEFFERLESNNYTYRSRYT--SWYVALKRTGYKLGSKTGP 141
 Qy 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAENWFVGLKNGSKCKRGRPTHY 185
 Db 142 GQKAILFLPMSAKS 155
 Qy 186 GQKAILFLPVS 199


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RESULT 11
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basilio C., Goldfarb M., Haub O., Martin G.R.;
RA "Isolation of cDNAs encoding four mouse FGF family members and
RA characterization of their expression patterns during embryogenesis.";
RA Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
CC EMBL; M30644; AAA37621.1; -
CC PIR; C37360; C37360.
CC HSSP; P09038; 1BFF.
CC MGD; MGI:95516; FGF2.
CC PFAM; PF00167; FGF.1.
CC PRINTS; PR00262; ILJHGF.
CC PRINTS; PR00263; HBGF.FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
CC Growth factor; Mitogen; Vascularization; Heparin-binding.
CC PROPEP 1 9
CC CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
CC BINDING 26 30 HEPARIN (POTENTIAL).
CC BINDING 115 118 HEPARIN (POTENTIAL).
CC SEQUENCE 154 AA; 17153 MW; 689677416274388 CRC64;
CC -----
Query Match 35.38; Score 508; DB 1; Length 154;
Best Local Similarity 54.58; Pred. No. 1.29e-96;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 23 GHFKDKPKLYCKNGGFFLRTHPDGRVDGVEKSDPHVKQLQAEERGVYSIKGVCANRYL 82
::: || || || || || || || || || || || || || || || || || || || ||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEVYIKSTERGQYL 125
::: || || || || || || || || || || || || || || || || || || || ||
Db 83 AKHEDGELLASKCVTECEFFERLESNNYTYRSKYS--SWYVALKRTGQYKLGSKTGP 140
|| || || || || || || || || || || || || || || || || || || || ||
QY 126 AMDTDGLLYGSQTPNECEFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185
|| || || || || || || || || || || || || || || || || || || || ||
Db 141 GQKAILFLPMSKS 154
|||||||
QY 186 GQKAILFLPVS 199
|||||||
RESULT 12
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;
RX MEDLINE; 89061721.
RA Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RA "Complementary DNA cloning and sequencing of rat ovarian basic
RA fibroblast growth factor and tissue distribution study of its mRNA.";
RA Biochem. Biophys. Res. Commun. 157:256-263(1988).
CC [2]
CC SEQUENCE FROM N.A.
CC TISSUE-BRAIN;
CC MEDLINE; 88262516.
CC Kurokawa T., Seno M., Igarashi K.;
CC "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
CC Nucleic Acids Res. 16:5201-5201(1988).
CC [3]
CC SEQUENCE OF 1-28 FROM N.A.
CC STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;
CC MEDLINE; 97200905.
CC Pasumarthi K.B.S., Jin Y., Cattini P.A.;
CC "Cloning of the rat fibroblast growth factor-2 promoter region and
CC its response to mitogenic stimuli in glioma C6 cells.";
CC J. Neurochem. 68:898-908(1997).
CC [4]
CC SEQUENCE OF 35-154 FROM N.A.
CC STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;
CC MEDLINE; 92329546.
CC El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
CC "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
CC mRNA containing a unique 3' untranslated region.";
CC Biochim. Biophys. Acta 1131:314-316(1992).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876.
CC PIR; A31674; A31674.
CC HSSP; P09038; 1BFF.
CC PFAM; PF00167; FGF.1.
CC PRINTS; PR00262; ILJHGF.
CC PRINTS; PR00263; HBGF.FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
CC Growth factor; Mitogen; Vascularization; Heparin-binding.
CC PROPEP 1 9
CC CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
CC FT
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Query Match 34.6%; Score 498; DB 1; Length 156;
Best Local Similarity 54.5%; Pred. No. 4.58e-94;

Result	Query			Length	DB	ID	Description	Pred. No.
	No.	Score	Match					
1	511	35.5	130	6	077767	BASIC FIBROBLAST GROWTH	2.70e-100	
2	509	35.4	196	4	P78443	21 KD BASIC FIBROBLAST	9.03e-100	
3	382	26.6	101	13	P79706	BASIC FGF (FRAGMENT)	6.40e-6	
4	346	24.1	146	13	Q07659	FIBROBLAST GROWTH FACT	8.07e-58	
5	313	21.8	115	11	O60487	BASIC FIBROBLAST GROWTH	1.36e-49	
6	301	20.9	194	6	P79150	KERATINOCYTE GROWTH FA	1.25e-46	
7	298	20.7	212	13	O42407	FIBROBLAST GROWTH FACT	6.80e-46	
8	274	19.1	252	11	089096	FHF-4B.	4.83e-40	
9	266	18.5	60	4	Q16588	ACIDIC FIBROBLAST GROW	4.12e-38	
10	265	18.4	59	4	Q16089	ACIDIC FIBROBLAST GROW	7.18e-38	
11	264	18.4	70	11	O54837	FIBROBLAST GROWTH FACT	1.25e-37	
12	261	18.2	198	11	Q35988	RUDOCAN CORE PROTEIN	6.56e-37	
13	260	18.1	196	13	Q9YH31	PUTATIVE FIBROBLAST GR	1.14e-36	
14	259	18.0	203	13	Q9YGD8	FIBROBLAST GROWTH FACT	1.98e-36	
15	257	17.9	246	13	Q9W6A1	FIBROBLAST GROWTH FACT	5.95e-36	
16	251	17.5	127	4	Q99517	FIBROBLAST GROWTH FACT	1.61e-34	
17	248	17.2	192	4	Q95830	FIBROBLAST GROWTH FACT	8.31e-34	
18	248	17.2	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	8.31e-34	
19	236	16.4	200	13	P79925	FIBROBLAST GROWTH FACT	5.68e-31	
20	226	15.7	425	5	O76031	LET-756 PROTEIN.	1.24e-28	

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DR PFAM; PF00167; FGF; 1.  
FT NON_TER      1  
FT NON_TER     101    101  
SQ SEQUENCE   101 AA; 11907 MW; 1CD93BB0 CRC32;  
  
Query Match          26.68; Score 382; DB 13; Length 101;  
Best Local Similarity 53.48; Pred. No. 6.40e-67;  
Matches           55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;  
  
Db       1 PKRYCKNGGFFLRINSQGVGDAREKSDSYIKLQLQAEBRGVYVIKGVCANRYLAMKKDD 60  
         ||||| ||||| :||||:||||| |:||| |:|:: :|||  
Qy       71 PRLYCNSGGHFILPDGVDTGRDSOHHIOLQLSAESVGVEVKSTETGGYLAMDTD 130  
         ||::| ::||::| |||||:|||||:|::|:|:  
         ||:|::|::|::|::|::|::|::|::|::|:  
Db       61 GRMLMALKWITDCFFFFPERLESNNYTYSRKYSD--WYVALKR 101  
         ||::|::|::|::|::|::|::|::|::|::|:  
Qy       131 GLLYGSOTPNECCLFLERLEENHYNTVISKKAHNWFVLGLKK 173  
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RESULT . 4  
ID QD7659 PRELIMINARY; PRF; 146 AA.  
AC QD7659;  
DT 01-NOV-1996 (TEMBLrel. 01, Created)  
DT 01-NOV-1996 (TEMBLrel. 01, Last sequence update)  
DT 01-NOV-1999 (TEMBLrel. 12, Last annotation update)  
DE DE FIBROBLAST GROWTH FACTOR.  
GN BFGF.  
OS Gallus gallus (Chicken).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 93246053.  
RA BORJA A.Z., ZELLER R., MEIJERS C.;  
RT "Expression of alternatively spliced bFGF first coding exons and  
RT antisense mRNAs during chicken embryogenesis.";  
RL Dev. Biol. 157:110-118(1993).  
RN [2]  
RP SEQUENCE OF 52-85 FROM N.A.  
RX MEDLINE; 90382254.  
RA MITRANI E., GRUENAUM Y., SHOHAT H., ZIV T.;  
RT "Fibroblast growth factor during mesoderm induction in the early chick  
RT embryo";  
RL Development 109:387-393(1990).  
DR EMBL; M95706; AAA48616.1; -  
DR EMBL; X56804; CAA40139.1; -  
DR HSPB; P09038; 2BFH  
DR PROSITE; PS00247; HBGF_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILHBGF.  
SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;  
  
Query Match          24.18; Score 346; DB 13; Length 146;  
Best Local Similarity 48.18; Pred. No. 8.07e-58;  
Matches           50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;  
  
Db       45 ERVSAMVKLOLAERGWSGIKVSAARFLAKMGEDGRLALKCATCECFPFERLESNNYN 104  
         :|||:| ||||| |::|:~::~||| ~::~|||:| ||||| |::|:~::~|||  
Qy       96 DRSDQHLOLSAESVGEVYIKTGTQCYLAMTDGLLYSGOTPNECLFLERLENHYN 155  
         ||:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|  
Db       105 TYRSRKYS--WYVALKRTGYKPGRPCTGPQGKAILFLPMSAKS 146  
         ||:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|  
Qy       156 TVISKHAENKNFWVLGKKGSKCRGPRTHYGQRKAILFLPLPVSS 199  
         ||:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|:|  
  
RESULT 5  
ID Q60487 PRELIMINARY; PRF; 115 AA.  
AC Q60487;  
DT 01-NOV-1996 (TEMBLrel. 01, Created)  
DT 01-NOV-1996 (TEMBLrel. 01, Last sequence update)  
DT 01-NOV-1999 (TEMBLrel. 12, Last annotation update)  
DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Evria porcellus. (Guinea pig).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
```

```
OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=PROSTATE;
RA RICCIARDELLI C.;
RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; L75974; AA853394.1; -.
DR HSSP; P09038; 2BPH.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1
SQ SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match      21.8%; Score 313; DB 11; Length 115;
Best Local Similarity 44.6%; Pred. No. 1.36e-49;
Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;

Db 1 GFFLRHPDGRVGVREKDPHKKHFKPA-EELCYQCSLSNRYLAMKEDGRLASKCV 59
80 GFFLRHPDGRVGVREKDPHKKHFKPA-EELCYQCSLSNRYLAMKEDGRLASKCV 139
60 TDCFFERLESNNYTYRSKYS--SWYVALKRTGYKLG 98
140 NEECLFLERLEENHYNTYIS-K-KHAEKNWFVGLKNGSKRG 180

RESULT 6
ID P79150 PRELIMINARY; PRT; 194 AA.
AC P79150;
DT 01-MAY-1997 (TRENBLrel. 03, Created)
DT 01-NOV-1997 (TRENBLrel. 03, Last sequence update)
DE KERATINOCYTE GROWTH FACTOR.
OS Canis familiaris (Dog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 96226403.
RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,
RA BRUEGEMEIER R.W., LIN Y.C.;
RT "keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine
RT prostate: molecular cloning of mRNA encoding canine KGF.";
RL DNA Cell Biol. 15:247-254(1996).
DR EMBL; U80800; AAB38972.1; -.
DR HSSP; P05230; 2AFG.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGF_FGF.
SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match      20.9%; Score 301; DB 6; Length 194;
Best Local Similarity 38.6%; Pred. No. 1.25e-46;
Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;

Db 69 LFCRTO-WYLRDKRCKVKGTOEMKNSYNTMEIRTVAGIVATKGYSEYILAMNKEGKL 127
74 LYCSNGHFRLIPDGTVDGTRDRSDQHQLQLSAESVGEYIKSTETGOYLAMDTDGLL 133
128 YAKKECNECDNFKELEENHYNTYASAKWTHSGGEMFVALNQKGVPRVGGKTKKEOKTAH 187
134 YGSOTPNEECLFLERLEENHYNTYIS-K-KHAEKNWFVGLKNGSKRGPRTHYGOKAIL 191
188 FLPMAT 194
192 FLPLPVS 198

RESULT 7
ID O42407 PRELIMINARY; PRT; 212 AA.
AC O42407;
DT 01-JAN-1998 (TRENBLrel. 05, Created)
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DT 01-JUN-1998 (TRENBLrel. 06, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 10.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 97330690.
RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,
RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;
RT "The mesenchymal factor, Fgf10, initiates and maintains the outgrowth
RT of the chick limb bud through interaction with FGF8, an apical
RL ectodermal factor.";
RL Development 124:2235-2244(1997).
DR EMBL; D86333; BAA24945.1; -.
DR HSSP; P03968; 1BAR.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00263; HBGF_FGF.
SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match      20.7%; Score 298; DB 13; Length 212;
Best Local Similarity 32.1%; Pred. No. 6.80e-46;
Matches 63; Conservative 47; Mismatches 76; Indels 10; Gaps 10;

Db 22 LLLFLVSVVVTCHDLQDMLSPSEATNSSSSSSFFSPSSAGRHVRSYN-HLOGD 80
9 LLLFVGVAESIRE-T-EVIDPQDLLEGYFSGALSD-EDVVGPGQSDDFELSGSD 65
81 VR-KR-KL-Y-SYNYFLKIEKNGKVSQTKKENCPSILEITSIVGVVAVKSINYYL 136
66 ANYKKPKLLYCSNGHFLRLLPDTGVTDRDRSDQHQLQLSAESVGEYIKSTETGOYL 125
137 ANKKGKYGKSEFNSDCKLKEIRIENGNYNTYASLWVHNGROMFVALNGRATRGOKT 196
126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYIS-K-KHAEKNWFVGLKNGSKRGPR 183
197 RRKNTSAHFPLPMVMS 212
184 HYGQRAILFLPLPVS 199

RESULT 8
ID O89096 PRELIMINARY; PRT; 252 AA.
AC O89096;
DT 01-NOV-1998 (TRENBLrel. 08, Created)
DT 01-NOV-1998 (TRENBLrel. 08, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE FHF-4B.
OS Rattus norvegicus (Rat), and Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 98267141.
RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;
RT "Structure and expression of a novel isoform of mouse FGF homologous
RT factor (FHF)-4.";
RL Biochim. Biophys. Acta 1398:38-41(1998).
DR EMBL; AB008908; BAA31544.1; -.
DR EMBL; AB008907; BAA31543.1; -.
DR HSSP; P03968; 1BAR.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match      19.1%; Score 274; DB 11; Length 252;
Best Local Similarity 37.5%; Pred. No. 4.83e-40;
Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;

Db 80 LYCROG-YLQMHHPDGLDGTGKDDSTNSTFLNLPVGLRVVAIQGVKTGLYIANGEGYL 138
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W P E L E H

(TM)

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MPSrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 16:00:07 2000; MasPar time 8.79 Seconds
684.604 Million cell updates/sec
bular output not generated.

Title: >US-09-121-017B-21
Description: (1-254) from US09121017B.pap
Perfect Score: 1813
Sequence: 1 MAPARLEALLFFVGVGAES.....PRTHYGQKAILFLPLPVSSD 254

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: a-geneseq36
1:geneseq

Statistics: Mean 32.851; Variance 142.196; scale 0.231

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.
1	989	54.6	140	1	R25914 Human acidic fibroblas	1.80e-82
2	989	54.6	140	1	R34437 Human acidic fibroblas	1.80e-82
3	989	54.6	140	1	P90068 Human acid fibroblast	1.80e-82
4	989	54.6	140	1	R74647 Human recombinant aFGF	1.80e-82
5	989	54.6	140	1	W04806 Human acidic fibroblas	1.80e-82
6	989	54.6	140	1	P70995 Sequence of human prot	1.80e-82
7	989	54.6	141	1	R10527 Human acidic fibroblas	1.80e-82
8	989	54.6	151	1	R05789 Human aFGF encoded by	1.80e-82
9	989	54.6	154	1	W52283 Human beta-endothelial	1.80e-82
10	989	54.6	154	1	W04805 Human beta-endothelial	1.80e-82
11	989	54.6	154	1	W06816 Human endothelial cell	1.80e-82
12	989	54.6	154	1	W75414 Human beta-endothelial	1.80e-82
13	989	54.6	155	1	P94037 Human acidic fibroblas	1.80e-82
14	989	54.6	155	1	R70812 FGF-1.	1.80e-82
15	989	54.6	155	1	P70482 Sequence encoded by co	1.80e-82
16	989	54.6	155	1	R80776 Fibroblast growth fact	1.80e-82
17	989	54.6	155	1	W53022 Fibroblast growth fact	1.80e-82
18	989	54.6	155	1	W75711 Fibroblast growth fact	1.80e-82
19	989	54.6	155	1	W75415 Human endothelial cell	1.80e-82
20	989	54.6	155	1	W92211 Human endothelial cell	1.80e-82
21	989	54.6	165	1	R05785 Human BECG encoded by	1.80e-82
22	989	54.6	168	1	W06818 Human endothelial cell	1.80e-82
23	989	54.2	134	1	W75413 Human alpha-endothelia	6.91e-82

ALIGNMENTS

RESULT 1
ID R25914 standard; peptide; 140 AA.
AC R25914;
DT 26-JAN-1993 (first entry)
DE Human acidic fibroblast growth factor.
KW viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;
KW herpes varicella; herpes zoster; cytomegalovirus; influenza;
KW human respiratory syncytial virus; Semliki Forest virus; HIV;
KW human immunodeficiency virus; Moloney Sarcoma virus.
OS Homo sapiens.
PN EP-497341-A.
PD 05-AUG-1992.
PF 30-JAN-1992; 101541.
PR 31-JAN-1991; GB-002145.
PR 09-JAN-1992; GB-000410.
PA (FARM) FARMITALIA ERBA SRL CARLO.
PI Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;
DR WPI: 92-260792/32.
PT Synergistic antiviral composition contains aFGF and sulphated
PT polysaccharide - for treating viral infections e.g. HSV-1 and -2,
PT cytomegalovirus, HIV, influenza virus etc.
PS Disclosure; Page 4; 20pp; English.
CC This sequence represents acidic fibroblast growth factor (aFGF).
CC aFGF, or its fragments may be used in a synergistic compsn. with an
CC antivirally active sulphated polysaccharide, and one or more
CC excipients. The compsn. may be used to control herpes simplex virus
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;
CC human respiratory syncytial virus; Semliki Forest virus; HIV or
CC Moloney Sarcoma virus. The combination of aFGF with sulphated
CC polysaccharide is found to have a greater antiviral activity than
CC expected for an additive effect. See also R25913-5.
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PGNYYKKLLYCSNGHFLRILPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETQ 63
QY 118 PVANYKKLLYCSNGHFLRILPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETQ 177
Db 64 YLAMTDGLLYGSQTFNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPT 123
QY 178 YLAMTDGLLYGSQTFNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPT 237
Db 124 HYGQKAILFLPLPVSSD 140
|||||

QY 238 HYGOKAILFLPLPVSSD 254

RESULT 2

ID R34497 standard; protein; 140 AA.
AC R34497;
DE 06-AUG-1993 (first entry)
DE Human acidic fibroblast growth factor.
KW aFGF; mutin; glycosylation site; glycoprotein.
OS Homo sapiens.
PN J05076356-A.
PD 30-MAR-1993.
PF 30-MAY-1991; 127435.
PR 31-MAY-1990; JP-143388.
PA (TAKE) TAKEDA CHEM IND LTD.
DR WPI; 93-139564/17.
PT FGF mutin prepn. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF mutin.
BT Disclosure; Page 3; 23pp; Japanese.
CC The invention covers mutins of FGF (esp. bFGF) which contain at least one glycosylation site. The mutins can be used to treat burns and thrombosis.
CC and thrombosis.
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 63

QY 118 PVANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 177

Db 64 YLAMDTGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 123

QY 178 YLAMDTGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 237

Db 124 HYGOKAILFLPLPVSSD 140

QY 238 HYGOKAILFLPLPVSSD 254

RESULT 3

ID P90068 standard; protein; 140 AA.
AC P90068;
DE 1-NOV-1989 (first entry)
DE Human acid fibroblast growth factor
KW Human acidic fibroblast growth factor; mutant.
OS Homo sapiens
PN EP-319052-A.
PD 14-JUN-1989.
PF 14-OCT-1988; 202306.
PR 22-OCT-1987; EP-244431.
PA (MERI) Merck and Co.
PI Thomas Jnr KA, Linemeyer DL;
DR WPI; 89-167092/23.
PT Mutant acidic fibroblast growth factor
PT - used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.
PS Disclosure; page 4; 36pp; English.
CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.
CC cell growth.
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 63

QY 118 PVANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 177

QY 118 PVANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 177

Db 64 YLAMDTGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 123

QY 178 YLAMDTGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 237

Db 124 HYGOKAILFLPLPVSSD 140

QY 238 HYGOKAILFLPLPVSSD 254

RESULT 4

ID R74647 standard; protein; 140 AA.
AC R74647;
DE 25-SEP-1995 (first entry)
DE Human recombinant aFGF.
KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis; mitogen.
OS Homo sapiens.
PN US5401832-A.
PD 28-MAR-1995.
PF 24-DEC-1984; 685923.
PR 24-DEC-1984; US-685923.
PR 12-SEP-1985; US-774359.
PR 30-MAY-1986; US-868473.
PR 11-JUL-1986; US-884460.
PR 04-JUN-1987; US-054991.
PR 04-MAY-1988; US-190293.
PR 08-FEB-1991; US-765472.
PR 25-SEP-1992; US-951365.
PA (MERI) MERCK & CO INC.
PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

PI WPI; 95-138983/18.
PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair
PT Claim 2; Column 30; 25pp; English.
CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating CC codons preferred by E. coli or mammalian cells, unique cloning CC sites, etc. This synthetic gene was mutagenized to obtain a gene CC encoding a human recombinant aFGF (R74647) having activity CC equivalent to the native protein.
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 63

QY 118 PVANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTGQ 177

Db 64 YLAMDTGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 123

QY 178 YLAMDTGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 237

Db 124 HYGOKAILFLPLPVSSD 140

QY 238 HYGOKAILFLPLPVSSD 254

RESULT 5

ID W04806 standard; Protein; 140 AA.
AC W04806;
DE 29-DEC-1996 (first entry)
DE Human acidic fibroblast growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; heparin-Sepharose affinity chromatography; probe; oligonucleotide; FGF; fibroblast growth factor; ss.
OS Homo sapiens.

PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON) RHONE POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI: 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PT Disclosure; Fig 8; 28pp; English.
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 63
QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177
Db 64 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVFLGKKNKSGCKRGPR 123
QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVFLGKKNKSGCKRGPR 237
Db 124 HYGOKAILFLPLPVSSD 140
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 6
ID P70995 standard; protein; 140 AA.
AC P70995;
DT 13-JUN-1991 (first entry)
DR Sequence of human proteinaceous factor (PFI) with mitogenic activity.
DR Cell growth promoter; mitogen; vascularisation; wound healing.
DR Homo sapiens.
DR misc_difference 140
FT Key Location/Qualifiers
FT misc_difference 140 /label= Asp-OH
PN EP-241136-A.
PD 14-OCT-1987.
PF 06-MAR-1987; 301969.
PR 07-MAR-1986; US-838096.
PA (HARD) HARVARD COLLEGE.
PI Lobb RR, Harper JW, Strydom DJ;
DR WPI: 87-285995/41.
DR Mitogenic polypeptide isolated from human brain tissue - useful
PT for increasing vascular effect in eg wound healing, or
PT generating endothelial cell linings for vascular prostheses, etc.
PS Claim 3; Page 1; 31pp; English.
CC The PFI of the invention was obtd. from human brain tissue. It has a
CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
CC affinity for heparin. PFI and fragments are useful for promoting the
CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
CC generating endothelial cell linings for vascular prostheses (all
CC claimed). The polypeptides are useful for increasing vascularisation.
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 63
QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177
Db 64 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVFLGKKNKSGCKRGPR 123
QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVFLGKKNKSGCKRGPR 237
Db 124 HYGOKAILFLPLPVSSD 140
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 7
ID R10527 standard; Protein; 141 AA.
AC R10527;
DT 15-APR-1991 (first entry)
DE Human acidic fibroblast growth factor gene.
KW aFGF; antibody; antigen; cancer; ss.
OS Homo sapiens.
FH Key Location/Qualifiers
FT region 2..12
FT /label= A
FT region 56..67
FT /label= B
FT region 104..114
FT /label= C
FT region 132..141
FT /label= D
PN J02306996-A.
PD 20-DEC-1990.
PF 03-JUL-1989; 172542.
PR 04-JUL-1988; JP-166275.
PR 03-JUL-1989; JP-172542.
PA (TAKE) TAKEDA CHEMICAL IND KK.
DR WPI: 91-040150/06.
DR N-PSDB; Q10399.
PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by
PT using complex of partial peptide(s) of acid fibroblast growth
PT factor and protein as antigen.
PT Disclosure; Fig 1; 19pp; Japanese.
CC The was deduced from a gene used to produce recombinant aFGF.
CC Peptides derived from the protein, esp. from A-D can be used to as
CC antigens to produce anti-aFGF antibodies. The peptides must
CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
CC (claim 8). The Abs can be used for immunochemically measuring aFGF,
CC and for purifying aFGF. They are useful as reagents in the diag-
CC nosis of various cancers or diseases of the CNS. Purified aFGF
CC has wound healing and nerve cell proliferating properties.
SQ Sequence 141 AA;

Query Match 54.6%; Score 989; DB 1; Length 141;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 5 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 64
QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177
Db 65 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVFLGKKNKSGCKRGPR 124
QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVFLGKKNKSGCKRGPR 237
Db 125 HYGOKAILFLPLPVSSD 141
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 8


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QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 177
DB 78 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 137
QY 178 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 237
DB 138 HYGOKAILFLPLPVSSD 154
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 11
ID W06816 standard; Protein; 154 AA.
AC W06816;
DE Human endothelial cell growth factor-beta.
KW Endothelial cell growth factor-beta; ECGF-beta.
OS Homo sapiens.
PN US571790-A.
PR 05-NOV-1996; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON ) RHONE-POULENC RORER PHARM INC.
PI Burgess W. Drohan WN, Jaye M, MacIag T;
DR WPI: 96-505421/50.
DR N-PSDB; T45983.
PT Recombinant human endothelial cell growth factors - for treating
PT damaged blood vessels, etc.
PS Claim 1; Column 16; 22pp; English.
CC Human recombinant endothelial cell growth factors (ECGF) beta
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
CC They can be produced in transformed prokaryotic or eukaryotic host
CC cells using DNA sequences (T45983 and T45984, respectively) derived
CC from the complete human ECGF cDNA (T45985). Large quantities of
CC the ECGFs are produced by culturing the host cells and recovering
CC the proteins. ECGFs have utility in the growth and amplification
CC of endothelial cells in culture. They can potentially be used to
CC treat damaged blood vessels and other endothelial cell-lined
CC structures, and also have diagnostic applns.
SQ Sequence 154 AA;

Query Match 54.6%; Score 989; DB 1; Length 154;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

DB 18 PPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 77
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 177
DB 78 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 137
QY 178 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 237
DB 138 HYGOKAILFLPLPVSSD 154
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 13
ID P94037 standard; protein; 155 AA.
AC P94037;
DE 25-JUN-1990 (first entry)
DE Human acidic fibroblast growth factor.
KW Acidic fibroblast growth factor.
OS Homo sapiens.
PN EP-298723-A.
PD 11-JAN-1989.
PR 06-JUL-1988; 306158.
PR 07-JUL-1987; US-070797.
PA (BIOT-) Biotechn Res Assoc.
PI Fiddes JC, Abraham JA, Protter A;
DR WPI; 89-009785/02.
DR N-PSDB; N93088.
PT Recombinant DNA encoding new fibroblast growth factor
PT analogues - useful eg for accelerating wound healing and
PT to control neovascularisation.
PS Disclosure; p: English.
CC See also P94038.
SQ Sequence 155 AA;

Query Match 54.6%; Score 989; DB 1; Length 155;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

DB 19 PPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 78
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 177
DB 79 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 138
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 12
ID W75414 standard; protein; 154 AA.
AC W75414;
DE Human beta-endothelial cell growth factor.
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
KW hybridisation; bovine; wound healing; prosthetic device.
OS Homo sapiens.
PN US5827826-A.
PD 27-OCT-1998.
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PF 04-NOV-1996; 743261.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON ) RHONE-POULENC RORER PHARM INC.
PI Burgess W. Drohan WN, Jaye M, MacIag T;
DR WPI; 98-594032/50.
PT Compositions for promoting wound healing - containing endothelial
PT cell growth factor polypeptides
PS Claim 1; Column 16; 23pp; English.
CC This sequence represents the amino acid sequence of the mature human
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
CC is identical to the alpha-ECGF but the beta sequence contains an extra
CC 20 N-terminal amino acids. The sequence was isolated from a human brain
CC stem cell cDNA library using a probe designed based on fragments of the
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
CC compositions for promoting wound healing. ECGF is also used to grow
CC cells on a prosthetic device.
SQ Sequence 154 AA;

Query Match 54.6%; Score 989; DB 1; Length 154;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

DB 18 PPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 77
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 177
DB 78 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 137
QY 178 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 237
DB 138 HYGOKAILFLPLPVSSD 154
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 13
ID P94037 standard; protein; 155 AA.
AC P94037;
DE 25-JUN-1990 (first entry)
DE Human acidic fibroblast growth factor.
KW Acidic fibroblast growth factor.
OS Homo sapiens.
PN EP-298723-A.
PD 11-JAN-1989.
PR 06-JUL-1988; 306158.
PR 07-JUL-1987; US-070797.
PA (BIOT-) Biotechn Res Assoc.
PI Fiddes JC, Abraham JA, Protter A;
DR WPI; 89-009785/02.
DR N-PSDB; N93088.
PT Recombinant DNA encoding new fibroblast growth factor
PT analogues - useful eg for accelerating wound healing and
PT to control neovascularisation.
PS Disclosure; p: English.
CC See also P94038.
SQ Sequence 155 AA;

Query Match 54.6%; Score 989; DB 1; Length 155;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

DB 19 PPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 78
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 177
DB 79 YLAMDTGLLYGSQTNEECFLERLEENHYNTYISKKAENWFWGLKNGSKRGPRPT 138
QY 238 HYGOKAILFLPLPVSSD 254
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QY 178 YLAMDTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 237
Db 139 HYGOKAILFLPLPVSSD 155
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 14

ID R70812 standard; protein; 155 AA.
AC R70812; 155
DT 01-SEP-1995 (first entry)
DE FGF-1.
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
OS saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
QW Homo sapiens.
FH Key Location/Qualifiers
FT misc_difference 31 /note= "Cys may be replaced by Ser"
FT misc_difference 132 /note= "Cys may be replaced by Ser"

WO9503831-A.
09-FEB-1995.
27-JUL-1994; 008511.
PR 02-AUG-1993; US-099924.
PR 29-OCT-1993; US-145829.
PA (PRIZ-) PRIZM PHARM INC.
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
PI Baird AJ, Lappi DA, Sosnowski BA;
WPI; 95-082038/11.
DR New monogenic preparations of cytotoxic conjugates and DNA -
PT contain fibroblast growth factors and cytotoxic agents for
PT treating FGF conditions such as tumours, diabetes and rheumatoid
PT arthritis.
PS Disclosure; Page 108-109; 128pp; English.
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70814) or
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
CC by conservative-Ser-substitutions. The fusion proteins are potent
CC cytotoxic agents to cells bearing the FGF receptor.
SQ Sequence 155 AA;

Query Match 54.6%; Score 989; DB 1; Length 155;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 19 PPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHLOLSAESVGEVYIKSTETGQ 78
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHLOLSAESVGEVYIKSTETGQ 177
79 YLAMDTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 138
QY 178 YLAMDTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 237
Db 139 HYGOKAILFLPLPVSSD 155
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 15

ID P70482 standard; Protein; 155 AA.
AC P70482;
DT 13-MAY-1991 (first entry)
DE Sequence encoded by complete cDNA sequence of human endothelial
DE cell growth factor (ECGF).
KW Endothelial cell regeneration; blood vessel regeneration.
OS Homo sapiens.
FH Key Location/Qualifiers
FT protein 2..15
FT protein /label= Beta ECGF
FT protein 16..21
FT protein /label= Acidic FGF
FT protein 22..155
FT protein /label= Alpha ECGF

PN WO8705332-A.
PD 11-SEP-1987.
PF 02-MAR-1987; U00425.
PR 03-MAR-1986; US-835594.
PR 26-MAR-1987; ES-000812.
PA (MELO-) MELOY LAB INC.
PA (RORE-) RORER BIOTECHN INC.
PA (RORE-) RORER.
PA BIOTECH INC.
PI Jaye M, Burgess W, Maciag T, Drohan W;
WPI; 87-264128/37.
DR N-PSDB; N70788
DT Human endothelial cell growth factor - produced by recombinant
PT DNA techniques, useful for wound healing
PS Example; Fig 8; 43pp; English.
CC To screen the human brain stem cDNA library for clones contg. ECGF
CC inserts, a specific oligonucleotide was designed. This
CC oligonucleotide was based upon a partial AA sequence analysis of
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
CC forth for comparison the AA sequence of cyanogen bromide-cleaved
CC bovine alpha and beta ECGF (P70834). The two clones that were
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
CC nucleotide sequence of these clones and the AA sequence deduced from
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
SQ Sequence 155 AA;

Query Match 54.6%; Score 989; DB 1; Length 155;
Best Local Similarity 98.5%; Pred. No. 1.80e-82;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 19 PPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHLOLSAESVGEVYIKSTETGQ 78
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHLOLSAESVGEVYIKSTETGQ 177
79 YLAMDTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 138
QY 178 YLAMDTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 237
Db 139 HYGOKAILFLPLPVSSD 155
QY 238 HYGOKAILFLPLPVSSD 254

Search completed: Tue Aug 29 16:00:40 2000
Job time : 33 secs.

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[S][E][Q][U][E][N][C][E]
[A][L][I][G][N][M][E][N][T]
[T][M]

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:58:50 2000; MasPar time 14.61 Seconds
820.223 Million cell updates/sec
abular output not generated.

Title: >US-09-121-017B-21
Description: (1-254)-from US09121017B.ppt
Perfect Score: 1813
Sequence: 1 MAPARLFALLLEFFVGVAES.....PRHYGQKAILFLPLPVSSD 254

Scoring table: PAM 150
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: pir64
1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 45.966; Variance 85.767; scale 0.536

Pred. NO. is the number of results predicted by chance to have a
score greater than or equal to the score of the result being printed,
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	989	54.6	155	1	A33665 acidic fibroblast gro	1.20e-184
2	976	53.8	155	2	D37360 acidic fibroblast gro	9.29e-182
3	976	53.8	155	2	S04147 acidic fibroblast gro	9.29e-182
4	973	53.7	155	1	A60721 acidic fibroblast gro	4.31e-181
5	958	52.8	152	2	A07076 acidic fibroblast gro	9.26e-178
6	926	51.1	155	1	GRBOA acidic fibroblast gro	1.17e-170
7	926	51.1	155	2	A60130 acidic fibroblast gro	1.17e-170
8	915	50.5	155	2	J00055 fibroblast growth fac	3.20e-168
9	827	45.6	198	2	JC1457 ryudocan precursor -	8.96e-149
10	546	30.1	202	2	A24210 ryudocan precursor -	1.28e-87
11	527	29.1	189	2	A48834 basic fibroblast grow	1.47e-83
12	521	28.7	146	1	S00185 basic fibroblast grow	2.80e-82
13	521	28.7	157	1	GRBOB basic fibroblast grow	2.80e-82
14	514	28.4	210	2	A32398 basic fibroblast grow	8.68e-81
15	513	28.3	154	2	C37360 basic fibroblast grow	1.42e-80
16	513	28.3	154	2	A31674 basic fibroblast grow	1.42e-80
17	505	27.9	198	2	JC5613 ryudocan precursor -	7.13e-79
18	503	27.7	164	2	S31622 basic fibroblast grow	1.90e-78
19	494	27.2	155	1	A40117 basic fibroblast grow	1.54e-76
20	471	26.0	137	2	I46711 fibroblast growth fac	1.13e-71
21	350	19.3	208	2	A48137 fibroblast growth fac	1.53e-46
22	350	19.3	208	2	S66486 fibroblast growth fac	1.53e-46
23	329	18.1	207	2	JC5941 fibroblast growth fac	2.77e-42

ALIGNMENTS

RESULT ENTRY	1	A33665	#type complete
ALTERNATE_NAMES	acidic fibroblast growth factor 1 precursor - human		
ORGANISM	beta-ECGF; endothelial cell growth factor beta;		
DATE	heparin-binding growth factor 1		
ACCESSIONS	#formal_name Homo sapiens #common_name man		
REFERENCE	10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change		
#authors	A33665; A32316; S18217; A43804; A24662; JH0707; S35535;		
	S35536; I39413; A23553; A24820; A24243; A24301; A26386;		
	A53639		
	A33665		
	Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.;		
	Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes,		
	J.C.		
#journal	Biochem. Biophys. Res. Commun. (1989) 164:1121-1129		
#title	Structural analysis of the gene for human acidic fibroblast		
#cross-references	growth factor.		
#accession	#cross-references MUID:90073637		
	A33665		
	#molecule_type DNA		
	#residues 1-155 #label MER		
	Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu,		
	A32316		
	I.M.		
#journal	Mol. Cell. Biol. (1989) 9:2387-2395		
#title	Cloning of the gene coding for human class I heparin-binding		
#cross-references	growth factor and its expression in fetal tissues.		
#accession	#cross-references MUID:89343957		
	A32316		
	#molecule_type DNA		
	#residues 1-155 #label WAN		
	#cross-references GB:M23087; NID:gi83875; PIDN:AAA52638.1; PID:g386768		
	S18217		
#authors	Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.;		
	Chiu, I.M.		
#journal	Oncogene (1991) 6:1521-1529		
#title	Cloning and sequence analysis of the human acidic fibroblast		
	growth factor gene and its preservation in leukemia		
	patients.		
#cross-references	MUID:92019819		
#accession	S18217		
	#molecule_type DNA		
	#residues 1-155 #label WA2		
	#cross-references EMBL:M23086		
	A43804		

fibroblast growth fac 2.82e-41
keratinocyte growth f 7.14e-37
fibroblast growth fac 2.82e-36
keratinocyte growth f 1.75e-35
fibroblast growth fac 4.37e-35
embryonic fibroblast 4.25e-34
embryonic fibroblast 1.53e-31
fibroblast growth fac 9.74e-32
transforming protein 2.40e-31
fibroblast growth fac 1.45e-30
transforming protein 2.27e-30
fibroblast growth fac 8.72e-30
HST protein - bovine 3.33e-29
fibroblast growth fac 4.84e-28
fibroblast growth fac 1.18e-27
fibroblast growth fac 2.61e-26
FGF-3 - chicken 1.52e-25
basic fibroblast grow 5.08e-24
fibroblast growth fac 7.86e-24
transforming protein 5.08e-24
keratinocyte growth f 1.21e-23

#authors Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal Oncogene (1990) 5:755-762
#title Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession A43804
##molecule_type mRNA
##residues 1-155 ##label CHI
##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE A24662
#authors Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.; Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.; Drohan, W.N.
#journal Science (1986) 233:541-545
#title Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.
#cross-references MUID:86261805
#accession A24662
##molecule_type mRNA
##residues 1-155 ##label JAV
##cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE JH0707
#authors Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielsen, A.A.J.; Goetzl, E.J.; Turck, C.W.
#journal J. Exp. Med. (1992) 175:1073-1080
#title An acidic fibroblast growth factor protein generated by alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession JH0707
##molecule_type mRNA
##residues 1-155 ##label YUY
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE S35535
#authors Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris, S.E.; Myers, R.L.; Chiu, I.M.
#journal Nucleic Acids Res. (1993) 21:489-495
#title Cloning of two novel forms of human acidic fibroblast growth factor (arGF) mRNA.
#cross-references MUID:93181239
#accession S35535
##status translation not shown
##molecule_type mRNA
##residues 1-58 ##label PAY
##cross-references GB:L01485
#accession S35536
##status translation not shown
##molecule_type mRNA
##residues 1-58 ##label PA2
##cross-references GB:L01487
REFERENCE I39412
#authors Crumley, G.; Dionne, C.A.; Jaye, M.
#journal Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title The gene for human acidic fibroblast growth factor encodes two upstream exons alternatively spliced to the first coding exon.
#cross-references MUID:90365758
#accession I39413
##status translation not shown
##molecule_type mRNA
##residues 1-40 ##label RES
##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170; GB:M60516; NID:g178232; PID:g553171
REFERENCE A23553
#authors Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession A23553
##molecule_type protein
##residues 16-155 ##label HAR
REFERENCE A24820
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title The complete amino acid sequence of human brain-derived

acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession A24820
##molecule_type protein
##residues 16-155 ##label GIM
REFERENCE A90122
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities.
#cross-references MUID:86186784
#accession A24243
##molecule_type protein
##residues 16-47 ##label GI2
##experimental_source brain
REFERENCE A91364
#authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors.
#cross-references MUID:86275260
#accession A24301
##molecule_type protein
##residues 16-30,'X',32-49 ##label GAU
REFERENCE A26386
#authors Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession A26386
##molecule_type protein
##residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',133-140,'X',142-152 ##label CHA
REFERENCE A53639
#authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.; Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.; Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
##molecule_type protein
##residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',133-140,'X',142-152 ##label CHA
GENETICS
#gene GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
16-155 #product fibroblast growth factor 1 #status experimental
129 #binding_site carbohydrate-(Asn)₁ (covalent). #status absent

SUMMARY #length 155 ##molecular_weight 17460 #checksum 9243
Query Match 54.6%; Score 989; DB 1; Length 155;
Best Local Similarity 98.5%; Pred No. 1.20e-184;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;
Db 19 PPGNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 78
| : |||||
Qy 118 PVANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177
| : |||||
Db 79 YLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNGSKRGPR 138
| : |||||
Qy 178 YLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNGSKRGPR 237
| : |||||


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Db 139 HYGQKAILFLPLPVSSD 155
QY 238 HYGQKAILFLPLPVSSD 254

RESULT 2
ENTRY TITLE
ALTERNATE_NAMES #type complete
ORGANISM #acidic fibroblast growth factor - mouse
DATE #aFGF; FGF-1
#formal_name Mus musculus #common_name house mouse
#sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360
REFERENCE #37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and Characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.
GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341
Query Match 53.8%; Score 976; DB 2; Length 155;
Best Local Similarity 91.7%; Pred. No. 9.29e-182;
Matches 132; Conservative 7; Mismatches 4; Indels 1; Gaps 1;
Db 12 LTERNLPLGNKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 71
QY 112 IPKRIS-PVANYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 170
Db 72 KGTETGOYLANDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 131
QY 171 KSTETGOYLANDTGILLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 230
Db 132 CKRGPRTHYGOKAILFLPLPVSSD 155
QY 231 CKRGPRTHYGOKAILFLPLPVSSD 254

RESULT 4
ENTRY TITLE
ALTERNATE_NAMES #type complete
ORGANISM #acidic fibroblast growth factor - golden hamster
DATE #heparin-binding growth factor 1
#formal_name Mesocricetus auratus #common_name golden hamster
#sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A60721
REFERENCE #A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-I gene and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS #growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573
Query Match 53.7%; Score 973; DB 1; Length 155;
Best Local Similarity 92.4%; Pred. No. 4.31e-181;
Matches 133; Conservative 5; Mismatches 5; Indels 1; Gaps 1;
Db 12 LTERNLPLGNKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 71
QY 112 IPKRIS-PVANYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 170
Db 72 KGTETGOYLANDTGILLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 131
QY 171 KSTETGOYLANDTGILLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 230
Db 132 CKRGPRTHYGOKAILFLPLPVSSD 155
QY 231 CKRGPRTHYGOKAILFLPLPVSSD 254

RESULT 5
ENTRY TITLE
ALTERNATE_NAMES #type fragment
ORGANISM #acidic fibroblast growth factor - pig (fragment)
DATE #formal_name Sus scrofa domestica #common_name domestic pig
#sequence_revision 31-Mar-1992 #text_change
31-Mar-1992
ACCESSIONS JH0476
REFERENCE #JH0476
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
```

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
##molecule_type mRNA
##residues 1-152 #label SCH
##cross-references EMBL:X60311; NID:g1873; PIDN:CAA42869.1; PID:g1874
##experimental_source heart
##note the hydrophobic core residues are packed around the internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
KEYWORDS superfamily fibroblast growth factor
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
SUMMARY
#length 152 #checksum 1124
Query Match 52.8%; Score 958; DB 2; Length 152;
Best Local Similarity 96.3%; Pred. No. 9.26e-178;
Matches 129; Conservative 2; Mismatches 3; Indels 0; Gaps 0;
Db 19 PPGNYKPKLLYCSNGHFLRIIPDGTGTRDSQHIQQLQLSAESVGEVYIKSTETGQ 78
QY 118 PVANYKPKLLYCSNGHFLRIIPDGTGTRDSQHIQQLQLSAESVGEVYIKSTETGQ 177
Db 79 YLAMDTGSLYGSQTSEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 138
QY 178 YLAMDTGSLYGSQTSEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 237
Db 139 HYGOKAILFLPLPV 152
QY 238 HYGOKAILFLPLPV 251
RESULT 6
ENTRY GKBOA #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change 18-Jun-1999
ACCESSIONS JH0613; S02102; S20661; A94281; S03953; A91010; A24477; B25043; C25043; A24539; A60884; A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE JH0613
#authors Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe, J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF transcripts.
#cross-references MUID:92246990
#accession JH0613
##molecule_type DNA
##residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.
#cross-references MUID:89083506
#accession S02102
##molecule_type mRNA
##residues 1-155 #label HAL
##cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Br u, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
FEBS Lett. (1988) 242:41-46
#journal Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
##molecule_type mRNA
##residues 1-155 #label ALT
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
##molecule_type mRNA
##residues 1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
##molecule_type mRNA
##residues 62-102 #label ABR
REFERENCE A94281
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore, M.; Disalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
##molecule_type protein
##residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe, N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine, porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
##molecule_type protein
##residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain: amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
##molecule_type protein
##residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts, G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
##molecule_type protein
##residues 2, 'GE', 5-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.; Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
Strydom, D.J.; Harper, J.W.; Lobb, R.R.
Biochemistry (1986) 25:945-951
#journal
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR

REFERENCE
A60884
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
J. Protein Chem. (1987) 6:163-171
#journal
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.
#accession A60884
#molecule_type protein
#residues 16-155 #label THO

REFERENCE
A37892
Kuo, M.D.; Huang, S.S.; Huang, J.S.
J. Biol. Chem. (1990) 265:16455-16463
#journal
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30, 'X', 32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76, 'X', 78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE
A61198
Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
Brain Res. Dev. Brain Res. (1991) 63:13-19
#journal
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.
#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26; 28-50; 53-110, 'H', 112, 'NTY'; 134-155 #label HIL

REFERENCE
I46024
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
Biochem. Biophys. Res. Commun. (1992) 188:843-850
#journal
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X56446; NID:9411; PIDN:CAA47063.1; PID:g412
#accession A34477
#journal
#title Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
#journal
#title Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24; 121-127; 134-143 #label SAS
#experimental_source heart
#comment The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.
#comment This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-136 (a region flanked by Lys-Lys dipeptides) and a number of neuropeptides, including a gastrin-releasing peptide from the pig
...
Note: remainder of annotations omitted.

Query Match 51.1%; Score 926; DB 1; Length 155;
Best Local Similarity 91.2%; Pred. No. 1.17e-170; Indels 0; Gaps 0;
Matches 125; Conservative 7; Mismatches 5;

Db 19 PLGNYKKPKLLYCSNGGYFLRLPDGTVDTGTRSDRQHQIQLCAESIGEVYIKSTETGQ 78
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDTGTRSDRQHQIQLCAESVGEVYIKSTETGQ 177
:|||||
Db 79 FLAMDTGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGRSKLGPRT 138
QY 178 YLAMDTGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGRSKLGPRT 237
:|||||
Db 139 HFGQKAILFLPLPVSSD 155
QY 238 HYGQKAILFLPLPVSSD 254
:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:9234372; PIDN:AAB19629.1; PID:9234373

REFERENCE
S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
#classification #superfamily fibroblast growth factor
#keywords growth factor

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SUMMARY          #length 155 #molecular-weight 17322 #checksum 7617
Query Match      51.18; Score 926; DB 2; Length 155;
Best Local Similarity 86.18; Pred. No. 1.17e-170;
Matches 124; Conservative 10; Mismatches 9; Indels 1; Gaps 1;

Db 12 LTERFGLPLGKPKLLKLYCSNGGHFRLIPDGVGTRDRSDQHILQLLSAEDVGEVYI 71
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 112 IPKRIS-PVANYKKPKLLKLYCSNGGHFRLIPDGVGTRDRSDQHILQLLSAEDVGEVYI 170
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 72 KSTASGOYLAMDNLGNGLYSQLPGECECLFLERLEENHYNTYISKKHADKNWFVGLKKNGN 131
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 171 KSTGTGOYLAMDNLGNGLYSQLPGECECLFLERLEENHYNTYISKKHADKNWFVGLKKNGS 230
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 132 SKLGRPRTHYGOKAILFLPLPVSSD 155
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 231 CKRGRPRTHYGOKAILFLPLPVSSD 254
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 8
ENTRY   JW0055 #type complete
TITLE   fibroblast growth factor-1 - sheep
ALTERNATE_NAMES FGF-1
ORGANISM #formal_name Ovis sp. #common_name sheep
DATE      17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
07-May-1999

ACCESSIONS JW0055
REFERENCE   JW0055
#authors   Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
            Donjerkovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
            Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
            W.H.
#journal   Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title     Primary structure of ovine fibroblast growth factor-1 deduced
            by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues  1-155 #label GRI
COMMENT    This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
            in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 155 #molecular-weight 17557 #checksum 8890

Query Match      50.58; Score 915; DB 2; Length 155;
Best Local Similarity 89.88; Pred. No. 3.20e-168;
Matches 123; Conservative 9; Mismatches 5; Indels 0; Gaps 0;

19 PLGNKPKLLKLYCSNGGHFRLIPDGVGTRDRSDQHILQLLSAEDVGEVYIKSTGTGQ 78
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
118 PVANYKKPKLLKLYCSNGGHFRLIPDGVGTRDRSDQHILQLLSAEDVGEVYIKSTGTGQ 177
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 79 FLAMDNLGNGLYSQLPGECECLFLERLEENHYNTYISKKHADKNWFVGLKKNGSKLGPRT 138
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 178 YLAMDTDLGNGLYSQLPGECECLFLERLEENHYNTYISKKHADKNWFVGLKKNGSKRGPRT 237
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 139 HFGOKAILFLPLPVSSD 155
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 238 HYGOKAILFLPLPVSSD 254
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 9
ENTRY   JCI457 #type complete
TITLE   ryudocan precursor - human
ALTERNATE_NAMES amphiglycan; core protein
ORGANISM #formal_name Homo sapiens #common_name man
DATE      30-Sep-1993 #sequence_revision 30-Sep-1993 #text_change
17-Mar-1999

ACCESSIONS JCI457
REFERENCE   JCI457
#authors   Kojima, T.; Inazawa, J.; Takamatsu, J.; Rosenberg, R.D.;
            Satio, H.
#journal   Biochem. Biophys. Res. Commun. (1993) 190:814-822
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#title          Human ryudocan core protein: Molecular cloning and
                characterization of the cDNA, and chromosomal localization
                of the gene.
#cross-references MUID:93176185
#accession      JCI457
#molecule_type mRNA
#residues       1-198 #label KOJ
#cross-references DBJ:D13292; NID:g286020; PID:d1003053; PID:g286021
REFERENCE       S26695
#authors       David, G.; van der Schueren, B.; Marynen, P.; Cassiman, J.J.;
                van den Berghe, H.
#journal       J. Cell Biol. (1992) 118:961-969
#title         Molecular cloning of amphiglycan, a novel integral membrane
                heparan sulfate proteoglycan expressed by epithelial and
                fibroblastic cells.
#cross-references MUID:92363936
#accession     S26695
#status        preliminary
#molecule_type mRNA
#residues      1-11, 'L', 13-198 #label DAV
#cross-references EMBL:X67016; NID:g28679; PID:g28680
GENETICS
#map_position  20q12
KEYWORDS       chondroitin sulfate proteoglycan; core protein; glycoprotein;
                heparan sulfate; transmembrane protein
FEATURE        1-18      #domain signal sequence #status predicted #label SIG\
19-198          #product ryudocan #status predicted #label MAT\
146-170          #domain transmembrane #status predicted #label TMM\
39,61,63         #binding_site heparan sulfate (Ser) (covalent) #status
                predicted
SUMMARY        #length 198 #molecular-weight 21641 #checksum 4522
Query Match     45.6%; Score 827; DB 2; Length 198;
Best Local Similarity 98.3%; Pred. No. 8.96e-149;
Matches 119; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARFALLFFVGVAESIRETEVIDPDQLLEGYFSGALPDDEDDVVGQESDDFEL 60
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 1 MAPARFALLFFVGVAESIRETEVIDPDQLLEGYFSGALPDDEDDVVGQESDDFEL 60
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 61 SGGSDLLDLEDSMIGVEVHVPLVDNHPERAGSGSQVTEPKKLEENEVTPKRISPYE 120
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 61 SGGSDLLDLEDSMIGVEVHVPLVDNHPERAGSGSQVTEPKKLEENEVTPKRISPYA 120
      : 11:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 121 E 121
      :
QY 121 N 121
      :

RESULT 10
ENTRY   A42410 #type complete
TITLE   ryudocan precursor - rat
ALTERNATE_NAMES amphiglycan; heparan sulfate proteoglycan core protein
                ryudocan
ORGANISM   #formal_name Rattus norvegicus #common_name Norway rat
DATE       04-Mar-1993 #sequence_revision 18-Nov-1994 #text_change
20-Mar-1998

ACCESSIONS A42410
REFERENCE   A42410
#authors   Kojima, T.; Shworak, N.W.; Rosenberg, R.D.
#journal   J. Biol. Chem. (1992) 267:4870-4877
#title     Molecular cloning and expression of two distinct
                cDNA-encoding heparan sulfate proteoglycan core proteins
                from a rat endothelial cell line.
#cross-references MUID:92165852
#accession   A42410
#status      preliminary
#molecule_type mRNA
#residues    1-202 #label KOJ
#cross-references GB:M81786; NID:g206822; PID:g206823
#experimental_source endothelial cell line
#note        sequence extracted from NCBI backbone (NCBIN:84028,
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NCBI:84029)
COMMENT  This protein plays a role in the cytoskeletal organization in
relation to the extracellular microenvironment.
KEYWORDS  chondroitin sulfate proteoglycan; core protein; glycoprotein;
heparan sulfate; transmembrane protein
FEATURE
1-23
24-202
150-174
44,65,67
SUMMARY  #domain signal sequence #status predicted #label SIG\
#product ryudocan core protein #status predicted #label
MATV
#domain transmembrane #status predicted #label TMV\
#binding_site heparan sulfate (Ser) (covalent) #status
predicted
#length 202 #molecular-weight 21962 #checksum 264
Query Match 30.1%; Score 546; DB 2; Length 202;
Best Local Similarity 72.4%; Pred. No. 1.28e-87;
Matches 89; Conservative 13; Mismatches 15; Indels 6; Gaps 4;
1 MAPVCLFAPLLLLGGFPVAPGESIRETEVIDPDLLGGRYFSGALPDDEDAGGLEQDS 60
1 MAPARLEA-LLLEFFVG-VA--ESIRETEVIDPDLLGGRYFSGALPDDEDVVGQES 55
Db 61 D-FELSGDLDDEERTPEVTSPLVDNHPENAPQIRVSPKLEENEVTPKR 119
QY 56 DDFELSGDLDDEDSMIGVEVYHPLVPLDNHPIPERAGSGSQVTEPKLEENEVTPKR 115
Db 120 VPS 122
QY 116 ISP 118
RESULT 11
ENTRY A48834 #type complete
TITLE basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE A48834
#authors Borja, A.Z.; Meijers, C.; Zeller, R.
#journal Dev. Biol. (1993) 157:110-118
#title Expression of alternatively spliced bFGF first coding exons
and antisense mRNAs during chicken embryogenesis.
#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note sequence extracted from NCBI backbone (NCBI:131000,
NCBI:131001)
REFERENCE S23636
#authors Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the
early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:g62855; PID:CRA40139.1; PID:g62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 189 #molecular-weight 20312 #checksum 8538
Query Match 29.1%; Score 527; DB 2; Length 189;
Best Local Similarity 54.4%; Pred. No. 1.47e-83;
Matches 74; Conservative 23; Mismatches 37; Indels 2; Gaps 1;
Db 56 PPGHKDPKRLKNGGFFLRINPDGRVDGVRKSDPHIKLQQAERGVSIVKGSANR 115
QY 118 PVANKPKLLKCSNGGHFLRILPDGTVDGTRDSQHIQLQSAESVGEVIKSTETGQ 177

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Db 116 FLAMKEDGRLLALKATECEFFERLESNNYNTYRSKYS--WYVALKRTGYKPGPKT 173
QY 178 YLAMDTDGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPT 237
Db 174 GPGQKAILFLPMSAKS 189
QY 238 HYGQKAILFLPLPVSS 253
RESULT 12
ENTRY S00185 #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatripin
ORGANISM #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS S00185
REFERENCE S00185
#authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
E.C.; Rubira, M.R.; Burgess, A.W.
#journal FEBS Lett. (1987) 224:128-132
#title Primary structure of ovine pituitary basic fibroblast growth
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#cross-references MUID:88055577
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DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS A24663; A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
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REFERENCE	A32398		
#authors	Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias, J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.; Smith, J.A.; Caput, D.		
#journal	Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840		
#title	High molecular mass forms of basic fibroblast growth factor are initiated by alternative CUG codons.		
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REFERENCE	A61537		
#authors	Shibata, F.; Baird, A.; Florjanczyk, R.Z.		
#journal	Growth Factors (1991) 4:277-287		
#title	Functional characterization of the human basic fibroblast growth factor gene promoter.		
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REFERENCE	A26642		
#authors	Kurokawa, T.; Sasada, R.; Ivane, M.; Igarashi, K.		
#journal	FEBS Lett. (1987) 213:189-194		
#title	Cloning and expression of cDNA encoding human basic fibroblast growth factor.		
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#accession	A26642		
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REFERENCE	A30924		
#authors	Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes, J.C.		
#journal	Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668		
#title	Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells.		
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#authors	Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman, J.; Gospodarowicz, D.; Fiddes, J.C.		
#journal	EMBO J. (1986) 5:2523-2528		
#title	Human basic fibroblast growth factor: nucleotide sequence and genomic organization.		
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#accession	S00297		


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REFERENCE
#authors    Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
             A.T.; Tobey, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
             A.T.; Bradley, J.D.; Sisk, W.P.
#journal    Biochemistry (1994) 33:10229-10248
#title      Multivalent ligand-receptor binding interactions in the
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             growth factor and heparin mechanism for receptor
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#authors    Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
             G.M.; Thomas, E.J.
#journal    Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#title      Reverse transcription with nested polymerase chain reaction
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#authors    Patry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
             FEBS Lett. (1994) 349:23-28
#journal    Purification and characterization of the 210-amino acid
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#title      Recombinant basic fibroblast growth factor form (FGF-2).
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#authors    Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
             G.R.
#journal    Dev. Biol. (1990) 138:454-463
#title      Isolation of cDNAs encoding four mouse EGF family members and
             characterization of their expression patterns during
             embryogenesis.
#cross-references MUID:90201563
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Search completed: Tue Aug 29 15:59:50 2000
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3	973	53.7	155	1	FGF1_MEASU	HEPARIN-BINDING GROWTH	3.64e-201
4	958	52.8	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH	2.08e-201
5	936	51.1	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH	2.10e-191
6	926	51.1	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH	2.10e-191
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8	546	30.1	202	1	SC4_RAT	SYNDECAN-4 PRECURSOR (7.79e-99
9	527	29.1	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH	2.91e-94
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11	521	28.7	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH	8.03e-93
12	514	28.4	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH	3.83e-91
13	513	28.3	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH	6.65e-91
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RX MEDLINE; 92019819.
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;
RT "Cloning and sequence analysis of the human acidic fibroblast growth
RT factor gene and its preservation in leukemia patients.";
RL Oncogene 6:1521-1529(1991).
RN [6]
RX SEQUENCE FROM N.A.
RP MEDLINE; 92202857.
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,
RA Turk E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist.";
RL J. Exp. Med. 175:1073-1080(1992).
RN [7]
RX SEQUENCE OF 1-154 FROM N.A.
RP MEDLINE; 94069734.
RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
RN [8]
RX SEQUENCE OF 1-40 FROM N.A.
RP MEDLINE; 90365758.
RA Crumley G., Dionne C.A., Jaye M.;
RT "The gene for human acidic fibroblast growth factor encodes two
RT upstream exons alternatively spliced to the first coding exon.";
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).
RN [9]
RX SEQUENCE OF 16-155.
RP MEDLINE; 86296647.
RA Harper J.W., Strydom D.J., Lobb R.R.;
RT "Human class I heparin-binding growth factor: structure and homology
RT to bovine acidic brain fibroblast growth factor.";
RL Biochemistry 25:4097-4103(1986).
RN [10]
RX SEQUENCE OF 16-155.
RP MEDLINE; 86295741.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "The complete amino acid sequence of human brain-derived acidic
RT fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).
RN [11]
RX SEQUENCE OF 16-155.
RP MEDLINE; 87048871.
RA Gautschi-Sova P., Mueller T., Boehlen P.;
RT "Amino acid sequence of human acidic fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).
RN [12]
RX SEQUENCE OF 16-47.
RP MEDLINE; 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
RT amino terminal sequences and specific mitogenic activities.";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
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RX SEQUENCE OF 16-49.
RP MEDLINE; 86275260.
RA Gautschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
RT human brain: acidic and basic fibroblast growth factors.";
RL FEBS Lett. 204:203-207(1986).
RN [14]
RX X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
RP MEDLINE; 96194129.
RA Blaber M., Disalvo J., Thomas K.A.;
RT "X-ray crystal structure of human acidic fibroblast growth factor.";
RL Biochemistry 35:2086-2094(1996).
RN [15]
RX STRUCTURE BY NMR OF 24-155.
RP MEDLINE; 94358885.
RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,
RA Gimenez-Gallego G.;
RT "1H-NMR assignment and solution structure of human acidic fibroblast
RT growth factor activated by inositol hexasulfate.";
RL J. Mol. Biol. 242:81-98(1994).
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RX STRUCTURE BY NMR OF 24-155.
RP MEDLINE; 97107535.
RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
RA Rico M., Gimenez-Gallego G.;
RT "Three-dimensional structure of acidic fibroblast growth factor in
RT solution: effects of binding to a heparin functional analog.";
RL J. Mol. Biol. 264:162-178(1996).
RN [17]
RX STRUCTURE BY NMR OF 25-155.
RP MEDLINE; 98387896.
RA Lozano R.M., Gimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral
RT action of suramin and suradistas.";
RL J. Mol. Biol. 281:895-915(1998).
RN [18]
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RX IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
RX VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
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RX -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
RX
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RX between the Swiss Institute of Bioinformatics and the EMBL outstation -
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RX PIR; A26386; A26386.
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 01-JUL-1989 (Rel. 11, Last sequence update)
 15-JUL-1999 (Rel. 38, Last annotation update)
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 RC SPECIES-RAT;
 RX MEDLINE; 89240051.
 RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
 RT "The nucleotide sequence of rat heparin binding growth factor 1
 RT (HBGF-1).";
 RL Nucleic Acids Res. 17:2867-2867(1989).
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 RP SEQUENCE FROM N.A.
 RC SPECIES-MOUSE;
 RX MEDLINE; 90201563.
 RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
 RT "Isolation of cDNAs encoding four mouse FGF family members and
 RT characterization of their expression patterns during embryogenesis.";
 RL Dev. Biol. 138:454-463(1990).
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 RC SPECIES-MOUSE;
 RX MEDLINE; 97128312.
 RA Madial F., Hackshaw K.V., Chiu I.M.;
 RT "Cloning and characterization of the mouse Fgf-1 gene.";
 RL Gene 179:231-236(1996).
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 RX MEDLINE; 97094746.
 RA Alam K.V., Frostholt A., Hackshaw K.V., Evans J.E., Rotter A.,
 RA Chiu I.M.;
 RT "Characterization of the 1b promoter of fibroblast growth factor 1
 RT and its expression in the adult and developing mouse brain.";
 RL J. Biol. Chem. 271:30263-30271(1996).
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 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -1- SUBUNIT: MONOMER.
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 DR HSSP; P05230; 2AXM.
 DR MGD; MGI:95515; FGF1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGFEGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 15
 FT CHAIN 15 155 HEPARIN-BINDING GROWTH FACTOR 1.
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FB4161 CRC64;
 Query Match 53.8%; Score 976; DB 1; Length 155;
 Best Local Similarity 91.7%; Pred. No. 6.45e-205;
 Matches 132; Conservative 7; Mismatches 4; Indels 1; Gaps 1;

DB 12 LTRFNLPNGNYKPKLLYCSNGGHEFLRLPDGTGTRSDQHIQLQLSAESVGEVY 71
 QY 112 IPKRIS-PVANYKPKLLYCSNGGHEFLRLPDGTGTRSDQHIQLQLSAESVGEVY 170
 DB 72 KGTETQYLAQMDTEGLLYGSOTNECLFLERLEENHYNTYISKHAEKNWFVGLKNGS 131
 QY 171 KSTETQYLAQMDTGILLYGSOTNECLFLERLEENHYNTYISKHAEKNWFVGLKNGS 230
 DB 132 CKRGRTHYGQKAILFLPLPVSSD 155
 QY 231 CKRGRTHYGQKAILFLPLPVSSD 254

RESULT 3 STANDARD; PRT; 155 AA.
 ID FGFL1_MESAU
 AC P34004;
 DT 01-FEB-1994 (Rel. 28, Created)
 DT 01-FEB-1994 (Rel. 28, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF).
 GN FGFL1 OR FGF-1.
 OS Mesocricetus auratus. (Golden hamster).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;
 OC Mesocricetus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 90270291.
 RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;
 RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-1 gene and cDNA
 RT and its modulation by steroids.";
 RL J. Cell. Biochem. 43:17-26(1990).
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -1- SUBUNIT: MONOMER.
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC
 CC THAN DOES BFGF.
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC PIR; A60721; A60721.
 DR HSSP; P05230; 2AXM.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.

FT DOMAIN 171 198 CYTOPLASMIC (POTENTIAL).
 FT CARBOHYD 39 39 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CARBOHYD 61 61 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CARBOHYD 63 63 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CONFLICT 12 12 F -> L (IN REF. 1).
 SQ SEQUENCE 198 AA: 21641 MW: 8229AA2733F77A10 CRC64;
 Query Match 45.6%; Score 827; DB 1; Length 198;
 Best Local Similarity 98.3%; Pred. No. 9,76e-168;
 Matches 119; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARFALLFFVGGVAESIRETEVIDPDQLLEGYFSGALPDDEDVVGQESDDFEL 60
 QY 1 MAPARFALLFFVGGVAESIRETEVIDPDQLLEGYFSGALPDDEDVVGQESDDFEL 60
 Db 61 SGGSDLDLSDSMIGPVRVHPLVPLDNHPIPERAGSGOVTEPKKLENEVPIKRISPV 120
 QY 61 SGGSDLDLSDSMIGPVRVHPLVPLDNHPIPERAGSGOVTEPKKLENEVPIKRISPV 120
 121 E 121
 121 N 121

RESULT 8
 ID SDC4_RAT STANDARD; PRT; 202 AA.
 AC P34901;
 DT 01-FEB-1994 (Rel. 28, Created)
 DT 01-FEB-1994 (Rel. 28, Last sequence update)
 DT 15-FEB-2000 (Rel. 39, Last annotation update)
 DE SYNDSCAN-4 PRECURSOR (RYUDOCAN CORE PROTEIN).
 GN SDC4 OR SYND4.
 OS Rattus norvegicus (Rat).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 92165852.
 RA Kojima T., Shworak N.W., Rosenberg R.D.;
 RT "Molecular cloning and expression of two distinct cDNA-encoding
 RT heparan sulfate proteoglycan core proteins from a rat endothelial
 RT cell line";
 RL J. Biol. Chem. 267:4870-4877(1992).
 RN [2]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 93266143.
 RA Shworak N.W., Kojima T., Rosenberg R.D.;
 RT "Isolation and characterization of ryudocan and syndecan heparan
 RT sulfate proteoglycans, core proteins, and cDNAs from a rat
 RT endothelial cell line";
 RL Haemostasis 23:161-176(1993).
 CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEAR HEPARAN SULFATE.
 CC -!- SUBCELLULAR LOCATION: TYPE I-MEMBRANE PROTEIN.
 CC -!- SIMILARITY: BELONGS TO THE SYNDECAN FAMILY OF INTEGRAL MEMBRANE
 CC PROTEOGLYCANS.
 CC
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 CC
 CC EMBL; M81786; AAA73167.1; -;
 CC EMBL; S61868; AAB26725.1; -;
 CC PIR; A42410; A42410.
 CC PFAM; PF01034; Syndecan; 1.
 CC PROSITE; PS00964; SYNDECAN; 1.
 CC Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein; Signal.
 FT SIGNAL 1 23 POTENTIAL.
 FT CHAIN 24 202 SYNDECAN-4.
 FT DOMAIN 24 149 EXTRACELLULAR (POTENTIAL).

FT TRANSMEM 150 174 POTENTIAL.
 FT DOMAIN 175 202 CYTOPLASMIC (POTENTIAL).
 FT CARBOHYD 44 44 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CARBOHYD 55 55 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 FT CARBOHYD 67 67 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
 SQ SEQUENCE 202 AA: 21962 MW: 5D9C8B3BF4C0D58A CRC64;
 Query Match 30.1%; Score 546; DB 1; Length 202;
 Best Local Similarity 72.4%; Pred. No. 7,79e-99;
 Matches 89; Conservative 13; Mismatches 15; Indels 6; Gaps 4;

Db 1 MAPVCLFAPLALLLGGFPVAPGESIRETEVIDPDQLLEGYFSGALPDDEDAGGLEQDS 60
 QY 1 MAPARLFA-LLFFVGG--VA--ESTIRETEVIDPDQLLEGYFSGALPDDEDVVGPGQES 55
 Db 61 D-FELSGSDLDLSDSMIGPVRVHPLVPLDNHPIPERAGSGOVTEPKKLENEVPIKR 119
 QY 56 DDFELSGSDLDLSDSMIGPVRVHPLVPLDNHPIPERAGSGOVTEPKKLENEVPIKR 115
 Db 120 VPS 122
 QY 116 ISP 118

RESULT 9
 ID FGF2_CHICK STANDARD; PRT; 158 AA.
 AC P48800;
 DT 01-FEB-1996 (Rel. 33, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BFGF).
 GN FGF2 OR FGF-2.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
 OC Gallus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 93246053.
 RA Borja A.Z., Zeller R., Meijers C.;
 RT "Expression of alternatively spliced bFGF first coding exons and
 RT antisense mRNAs during chicken embryogenesis";
 RL Dev. Biol. 157:110-118(1993).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC
 CC EMBL; M95707; AAA48617.1; -;
 CC HSSP; P09038; 1BFF.
 CC PFAM; PF00167; FGF; 1.
 CC PRINTS; PR00262; ILJHBGF.
 CC PRINTS; PR00263; HBGFHGF.
 CC PROSITE; PS00247; HBGF_FGF; 1.
 CC Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 12
 FT CHAIN 13 158 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 30 34 HEPARIN (POTENTIAL).
 FT BINDING 119 122 HEPARIN (POTENTIAL).
 SQ SEQUENCE 158 AA: 17374 MW: 7969B684C17F1816 CRC64;

Query Match 29.1%; Score 527; DB 1; Length 158;
 Best Local Similarity 54.4%; Pred. No. 2.91e-94;
 Matches 74; Conservative 23; Mismatches 37; Indels 2; Gaps 1;

Db 25 PPGHFKPKRLKCKNGGFFLRINPDGRVGVREKSDPHIKLQLOAERGVSIVKGVSNR 84
 QY 118 PVANYKPKLLKCSNGGHFLRLPDGVGTDRSDQHIOQLSAESVGEVYIKSTETGQ 177
 Db 85 FLANKEDGRLLAKCATECEFFERLESNNYNTYRSKYS--WYVALKRTGYKPGPKT 142
 QY 178 YLAMDTGLLYGSGTPEECFLERLEENHYNTYISKHAEKNFVGLKNGSKCRGPR 237
 Db 143 GPGOKAILFLPMSAKS 158
 QY 238 HYQKAILFLPLVSS 253

SUULT 10
 FGF2 SHEEP STANDARD; PRT; 155 AA.
 P20003;
 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2 OR FGF-2.
 OS Ovis aries (Sheep).
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
 OC Bovidae; Caprinae; Ovis.
 [1]
 RN SEQUENCE FROM N.A.
 RA Sutton R., Ward W.G., Raphael K.A., Cam G.R.;
 RL Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.
 [2]
 RN SEQUENCE OF 9-155.
 RX MEDLINE; 88055577.
 RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.,
 RA Rubira M.R., Burgess A.W.;
 RT "Primary structure of ovine pituitary basic fibroblast growth
 RT factor";
 RL FEBS Lett. 224:128-132(1987).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC
 CC EMBL; L36136; AAA31519.1;
 DR PIR; S00185; S00185.
 DR HSP; P09038; 1BFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 DR PRINTS; PR00263; HBGFHFG.
 DR PROSITE; PS00247; HBGF.FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).
 FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).
 FT BINDING 27 31 HEPARIN (POTENTIAL).

FT BINDING 116 119 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;
 Query Match 28.7%; Score 521; DB 1; Length 155;
 Best Local Similarity 55.1%; Pred. No. 8.03e-93;
 Matches 75; Conservative 22; Mismatches 37; Indels 2; Gaps 1;

Db 22 PPGHFKPKRLKCKNGGFFLRINPDGRVGVREKSDPHIKLQLOAERGVSIVKGVSNR 81
 QY 118 PVANYKPKLLKCSNGGHFLRLPDGVGTDRSDQHIOQLSAESVGEVYIKSTETGQ 177
 Db 82 YLAMKEDGRLLAKCATECEFFERLESNNYNTYRSKYS--SWYVALKRTGYKPGPKT 139
 QY 178 YLAMDTGLLYGSGTPEECFLERLEENHYNTYISKHAEKNFVGLKNGSKCRGPR 237
 Db 140 GPGOKAILFLPMSAKS 155
 QY 238 HYQKAILFLPLVSS 253

RESULT 11
 ID FGF2 BOVIN STANDARD; PRT; 155 AA.
 AC P03969;
 DT 23-OCT-1986 (Rel. 02, Created)
 DT 23-OCT-1986 (Rel. 02, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN) [CONTAINS: KIDNEY-DERIVED GROWTH
 DE FACTOR].
 GN FGF2 OR FGF-2.
 OS Bos taurus (Bovine).
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
 OC Bovidae; Bovinae; Bos.
 [1]
 RN SEQUENCE FROM N.A.
 RX MEDLINE; 86261806.
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,
 RA Hjerrild K.A., Gospodarowicz D., Fiddes J.C.;
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic
 RT protein, basic fibroblast growth factor";
 RL Science 233:545-548(1986).
 [2]
 RN SEQUENCE FROM N.A.
 RX MEDLINE; 87217066.
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
 RT "Human basic fibroblast growth factor: nucleotide sequence, genomic
 RT organization, and expression in mammalian cells";
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
 [3]
 RN SEQUENCE OF 10-155.
 RX MEDLINE; 86016731.
 RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,
 RA Gospodarowicz D., Boehlen P., Guillemin R.;
 RT "Primary structure of bovine pituitary basic fibroblast growth factor
 RT (FGF) and comparison with the amino-terminal sequence of bovine brain
 RT acidic FGF";
 RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).
 [4]
 RN SEQUENCE OF 1-9.
 RX MEDLINE; 86295737.
 RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;
 RT "Isolation of an amino terminal extended form of basic fibroblast
 RT growth factor";
 RL Biochem. Biophys. Res. Commun. 138:580-588(1986).
 [5]
 RN SEQUENCE OF 25-41.
 RC TISSUE=KIDNEY.
 RX MEDLINE; 86095426.
 RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;
 RT "Isolation and partial characterization of an endothelial cell growth
 RT factor from the bovine kidney: homology with basic fibroblast growth
 RT factor";

Regul. Pept. 12:201-213(1985).
 [6]
 RN SEQUENCE OF 21-40.
 RP TISSUE-KIDNEY.
 RC MEDLINE; 87119165.
 RX Ueno N., Baird A., Esch F., Shimasaki S., Ling N., Guillemin R.;
 RA "Purification and partial characterization of a mitogenic factor from
 RT bovine liver: structural homology with basic fibroblast growth
 RT factor.";
 RL Regul. Pept. 16:135-145(1986).
 RN [7]
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
 RX MEDLINE; 91095983.
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RA Hsu B.T., Rees D.C.;
 RT "Three-dimensional structures of acidic and basic fibroblast growth
 RT factors.";
 RL Science 251:90-93(1991).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC
 CC EMBL; M13440; AAA30518.1; -
 CC PIR; A24663; GRBOB.
 CC PIR; A24819; A24819.
 CC PIR; A32878; A32878.
 CC PDB; 1BAS; 31-OCT-93.
 CC PFAM; PF00167; FGF; 1.
 CC PRINTS; PR00262; IL1HBGF.
 CC PRINTS; PR00263; HBGFPGF.
 CC PROSITE; PS00247; HBGF_FGF; 1.
 CC Growth factor; Mitogen; Vascularization; Heparin-binding;
 CC 3D-structure.
 CC
 CC PROPEP 1 9
 CC CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 CC CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.
 CC SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
 CC SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
 CC BINDING 27 31 HEPARIN (POTENTIAL).
 CC BINDING 116 119 HEPARIN (POTENTIAL).
 CC STRAND 30 34
 CC TURN 35 38
 CC STRAND 39 43
 CC TURN 45 46
 CC STRAND 49 52
 CC TURN 55 56
 CC HELIX 58 60
 CC STRAND 62 68
 CC TURN 69 70
 CC STRAND 71 76
 CC TURN 77 80
 CC STRAND 81 85
 CC TURN 87 88
 CC STRAND 91 94
 CC HELIX 99 101
 CC STRAND 103 107
 CC TURN 109 110
 CC STRAND 113 117
 CC TURN 121 122
 CC STRAND 124 124

FT STRAND 127 127
 FT TURN 129 130
 FT STRAND 133 133
 FT HELIX 136 138
 FT TURN 141 142
 FT HELIX 144 146
 FT STRAND 148 151
 SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;
 Query Match 28.7%; Score 521; DB 1; Length 155;
 Best Local Similarity 55.1%; Pred. No. 8.03e-93;
 Matches 75; Conservative 22; Mismatches 37; Indels 2; Gaps 1;
 Db 22 PPGHKPRKRLKCKNGGFFLRHPDGRVDRKSPHKLQLOAERGVWSIKGYCANR 81
 QY 118 PVANKPKPLLKCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAESVGEVYIKSTETQ 177
 Db 82 YLAMKEDGSLASKCVTDCFFERLESNNYTSRKY--SWYVALKRTQYKLGPR 139
 QY 178 YLAMTDGLLYGSGTPNEBCLFLERLEENHYNTYISKHAENWFVGLKKGSKRGPR 237
 Db 140 GFGQRAILFLPMSAKS 155
 QY 238 HYGQRAILFLPVS 253
 RESULT 12
 ID FGF2_HUMAN STANDARD; PRT; 155 AA.
 AC P09038;
 DT 01-NOV-1988 (Rel. 09, Created)
 DT 01-NOV-1988 (Rel. 09, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2 OR FGFβ.
 OS Homo sapiens (Human).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 87053817.
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,
 RA "Human basic fibroblast growth factor: nucleotide sequence, genomic
 RT organization, and expression in mammalian cells.";
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
 RN [3]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 87213238.
 RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,
 RA Rifkin D.B.;
 RT "A form of human basic fibroblast growth factor with an extended
 RT amino terminus.";
 RL Biochem. Biophys. Res. Commun. 144:543-550(1987).
 RN [4]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 87162468.
 RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;
 RT "Cloning and expression of cDNA encoding human basic fibroblast
 RT growth factor.";
 RL FEBS Lett. 213:189-194(1987).
 RN [5]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 89184522.
 RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,
 RA Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,

RA Caput D.;
RT "High molecular mass forms of basic fibroblast growth factor are
initiated by alternative CUG codons.";
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
RN [6]
RP SEQUENCE OF 10-35.
RX MEDLINE; 86275260.
RA Gautschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
human brain: acidic and basic fibroblast growth factors.";
RL FEBS Lett. 204:203-207(1986).
RN [7]
RP SEQUENCE OF 10-39.
RX MEDLINE; 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
amino terminal sequences and specific mitogenic activities.";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
RN [8]
RP SEQUENCE OF 2-22.
RX MEDLINE; 87156686.
RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;
RT "Amino-terminal sequence of a large form of basic fibroblast growth
factor isolated from human benign prostatic hyperplastic tissue.";
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).
RN [9]
RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
RX MEDLINE; 91195367.
RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;
RT "Three-dimensional structure of human basic fibroblast growth
factor.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).
RN [10]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 94004464.
RA Eriksson A.E., Cousens L.S., Matthews B.W.;
RT "Refinement of the structure of human basic fibroblast growth factor
at 1.6-A resolution and analysis of presumed heparin binding sites by
selenate substitution.";
RL Protein Sci. 2:1274-1284(1993).
RN [11]
RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).
RX MEDLINE; 91195368.
RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;
RT "Three-dimensional structure of human basic fibroblast growth factor,
a structural homolog of interleukin 1 beta.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).
RN [12]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 92121151.
RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;
RT "Crystal structure of basic fibroblast growth factor at 1.6-A
resolution.";
RL J. Biochem. 110:360-363(1991).
RN [13]
RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).
RX MEDLINE; 91095983.
RA Zhu X., Komlya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
RT Hsu B.T., Rees D.C.;
RL "Three-dimensional structures of acidic and basic fibroblast growth
factors.";
RL Science 251:90-93(1991).
RN [14]
RP STRUCTURE BY NMR.
RX MEDLINE; 97040521.
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;
RT "High-resolution solution structure of basic fibroblast growth factor
determined by multidimensional heteronuclear magnetic resonance
spectroscopy.";
RL Biochemistry 35:13552-13561(1996).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND

CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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entities requires a license agreement (See <http://www.isb-sib.ch/announce/>
or send an email to license@isb-sib.ch).
CC -----
CC EMBL; M17599; AAA52534.1; ALT_INIT.
DR EMBL; X04431; CAA28027.1; -
DR EMBL; X04432; CAA28028.1; -
DR EMBL; X04433; CAA28029.1; -
DR EMBL; M27968; AAA52448.1; -
DR EMBL; J04513; AAA52533.1; ALT_INIT.
DR PIR; A25824; A25824.
DR PIR; A26642; A26642.
DR PIR; B24243; B24243.
DR PIR; B24301; B24301.
DR PIR; B32878; B32878.
DR PIR; S00297; S00297.
DR PDB; 2FGF; 15-APR-92.
DR PDB; 4FGF; 15-JUL-93.
DR PDB; 1FGA; 15-JUL-93.
DR PDB; 1BFB; 03-APR-96.
DR PDB; 1BFC; 03-APR-96.
DR PDB; 1BFF; 16-JUN-97.
DR PDB; 1BFG; 31-JAN-94.
DR PDB; 2BFH; 30-APR-94.
DR PDB; 1BLA; 08-NOV-96.
DR PDB; 1BLD; 08-NOV-96.
DR MIM; 134920; -
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILLHGF.
DR PRINTS; PR00263; HGFHGF.
DR DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding;
KW 3D-structure.
FT PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
FT STRAND 30 34
FT TURN 35 38
FT STRAND 39 43
FT TURN 45 46
FT STRAND 49 52
FT TURN 55 56
FT HELIX 58 60
FT STRAND 62 66
FT TURN 69 70
FT STRAND 71 76
FT TURN 77 80
FT STRAND 81 85
FT TURN 87 88
FT STRAND 91 94
FT HELIX 99 101
FT STRAND 103 107
FT TURN 109 110
FT STRAND 113 117
FT TURN 121 122
FT STRAND 124 124
FT STRAND 127 127
FT TURN 129 130
FT STRAND 132 133
FT HELIX 136 138

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CC EMBL; M22427; AAA41210.1; -
DR EMBL; X07285; CAA30265.1; -
DR EMBL; U78079; AAC53225.1; -
DR EMBL; X61697; CAA43863.1; -
DR PIR; S00876; S00876.
DR PIR; A31674; A31674.
DR HSP; P09038; 1BFF.
DR PFAM; PF00167; FGF. 1.
DR PRINTS; PR00262; ILIHGF.
DR PRINTS; PR00263; HGFHGF.
DR PROSITE; PS00247; HGF-FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;
Query Match 28.3%; Score 513; DB 1; Length 154;
Best Local Similarity 54.4%; Pred. No. 6,65e-91;
Matches 74; Conservative 23; Mismatches 37; Indels 2; Gaps 1;
Db 21 PGHFKDKPKRYCKNGGFFLRHPDGRVDGVREKSDPHVKLQQAERGVSIRGVCAVR 80
QY 118 PVANKPKKLLYCSNGHFLRLPDGTVDGTRSDQHLQLQSAESVGEVYIKSTGTGQ 177
Db 81 YLAKEDGRLASKCVTECEFFERLENNYNTYRSKYS--SWYVALKRGTQYKLSKT 138
QY 178 YLAMDIDGLLYGSQTPNECLFLERLEENHYNTYISKHAENKWFVGLKNGSCKRGPT 237
Db 139 GPGKAILFLPMSAKS 154
QY 238 HYGKAILFLPLPVS 253

RESULT 15
ID SDCA4_MOUSE STANDARD; PRT; 198 AA.
AC O35988;
DT 15-FEB-2000 (Rel. 39, Created)
DT 15-FEB-2000 (Rel. 39, Last sequence update)
DT 15-FEB-2000 (Rel. 39, Last annotation update)
SYNDECAN-4 PRECURSOR (RYUDOCAN CORE PROTEIN).
SDCA4.
Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN=C3H/AN, AND 129/SVJ;
RX MEDLINE: 97420681.
RA Tsuzuki S., Kojima T., Katsumi A., Yamazaki T., Sugiura I., Saito H.;
RT Molecular cloning, genomic organization, promoter activity, and
RT tissue-specific expression of the mouse ryudocan gene.";
RL J. Biochem. 122:17-24(1997).
CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEAR HEPARAN SULFATE.
CC -!- SUBCELLULAR LOCATION: TYPE I MEMBRANE PROTEIN.
CC -!- TISSUE SPECIFICITY: UBIQUITOUS.
CC -!- SIMILARITY: BELONGS TO THE SYNDECAN FAMILY OF INTEGRAL MEMBRANE
CC PROTEOGLYCANS.
CC
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CC or send an email to license@isb-sib.ch.

CC EMBL; D89571; BAA22135.1; -
DR EMBL; D89572; BAA22136.1; -
DR MGD; MGI:1349164; SDCA4.
DR PFAM; PF01034; Syndecn; 1.
DR PROSITE; PS00964; SYNDECAN; 1.
KW Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein; Signal.
FT SIGNAL 1 23 POTENTIAL.
FT CHAIN 24 198 SYNDECAN-4.
FT DOMAIN 24 145 EXTRACELLULAR (POTENTIAL).
FT TRANSMEM 146 170 POTENTIAL.
FT DOMAIN 171 198 CYTOPLASMIC (POTENTIAL).
FT CARBOHYD 44 44 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
FT CARBOHYD 62 62 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
FT CARBOHYD 64 64 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).
SQ SEQUENCE 198 AA; 21482 MW; 4246963EC6A25915 CRC64;
Query Match 27.9%; Score 505; DB 1; Length 198;
Best Local Similarity 72.4%; Pred. No. 5.48e-89;
Matches 89; Conservative 13; Mismatches 12; Indels 9; Gaps 6;
Db 1 MAPACLLAPILLLLGGFPLVPGESIRETEVIDPDLLLEGYFSGALPDDEDA-G-G--S 56
QY 1 MAPARLEA-LILLFFVG--VA-ESIRETEVIDPDLLLEGYFSGALPDDEDDVYVPGQES 55
Db 57 DDFELSGGDLDDTEPRPPEVIEPLVPLDNHPIENAPQIRVPSEPKLEENEVIPKR 116
QY 56 DDFELSGGDLDDLEDSMIGVEVHVPLVPLDNHPIERAGSGSQVTEPKKLEENEVIPKR 115
Db 117 APS 119
QY 116 ISP 118
Search completed: Tue Aug 29 15:57:12 2000
Job time : 24 secs.

Result No.	Score	Query Match	Length	DB	ID	Description	Pred. No.
1	514	28.4	196	4	P78443	21 KD BASIC FIBROBLAST	2.07e-94
2	511	28.2	130	6	Q77647	BASIC FIBROBLAST GROWTH	1.14e-93
3	505	27.9	198	11	C53988	RYOUCAN CORE PROTEIN	3.47e-92
4	382	21.1	101	13	P79706	BASIC FGF (FRAGMENT)	3.14e-62
5	346	19.1	146	13	Q70769	FIBROBLAST GROWTH FACT	1.15e-53
6	313	17.3	115	11	Q60487	BASIC FIBROBLAST GROWTH	6.33e-46
7	301	16.6	194	6	P79150	KERATINOCYTE GROWTH FA	3.85e-43
8	289	15.9	212	13	Q43407	FIBROBLAST GROWTH FACT	2.24e-40
9	274	15.1	70	11	O54837	FIBROBLAST GROWTH FACT	6.00e-37
10	274	15.1	252	11	O83096	FHF-4B.	6.00e-37
11	270	14.9	60	4	Q16588	ACIDIC FIBROBLAST GROW	4.86e-36
12	269	14.8	59	4	Q16089	ACIDIC FIBROBLAST GROW	8.19e-36
13	260	14.3	196	13	Q9RH31	POTATIVE FIBROBLAST GR	8.83e-34
14	257	14.2	243	13	Q9W6A1	FIBROBLAST GROWTH FACT	4.17e-33
15	251	13.8	137	4	Q99517	FIBROBLAST GROWTH FACT	9.22e-32
16	250	13.8	206	13	Q9YGD8	FIBROBLAST GROWTH FACT	1.54e-31
17	248	13.7	192	4	Q9S830	FIBROBLAST GROWTH FACT	4.31e-31
18	248	13.7	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	4.31e-31
19	236	13.0	200	13	P79925	FIBROBLAST GROWTH FACT	1.98e-28
20	226	12.5	435	5	O76831	LET-756 PROTEIN.	3.10e-26

ALIGNMENTS

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RESULT 1
ID P78443 PRELIMINARY; PRT; 196 AA.
AC P78443;
DT 01-MAY-1997 (TrEMBLrel. 03, Created)
DT 01-MAY-1997 (TrEMBLrel. 03, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE 21 KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).
GN BFGF2.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
OC [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89184522.
RA PRATS H., KAGHAD M., PRATS A.C., KLAGSBRUN M., LELIAS J.M.,
RA LIAUZON P., CHALON P., TAUBER J.P., AMALRIC F., SMITH J.A., CAPUT D.;
RA "High molecular mass forms of basic fibroblast growth factor are
RT initiated by alternative CUG codons.";
RT Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
RL [2]
RN
RP SEQUENCE OF 81-168 FROM N.A.
RX MEDLINE; 93038590.
RA WATSON R., ANTHONY F., PICKETT M., LAMBDEN P., MASSON G.M.,
RA THOMAS E.J.;
RT "Reverse transcription with nested polymerase chain reaction shows
RT expression of basic fibroblast growth factor transcripts in human
RT granulosa and cumulus cells from in vitro fertilisation patients.";
RL Biochem. Biophys. Res. Commun. 187:1227-1231(1992).
DR EMBL; J04513; AAA52532.1; -
DR EMBL; S47380; AAD13853.1; -
DR HSSP; P09038; IBFF.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGFFGF.
DR SEQUENCE 196 AA; 21203 MW; 49B75E39 CRC32;

Query Match 28.4%; Score 514; DB 4; Length 196;
Best Local Similarity 54.4%; Pred. No. 2,07e-94;
Matches 74; Conservative 23; Mismatches 37; Indels 2; Gaps 1

Db 63 PGCFKDPKRLCYKNGGFFRIIHPDGVDCVRKSDPHKLQIQAEERGVSIVKGVCA NR 122
QY 118 PVANYKPEKLYKNGGFFRIILPDDTVDGTRDSQHIQLQLSAESVGEYIKSTGTQ 177

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Db 123 YLAKMEDGRLLAKCVTDCEFFERLESNNYTYRSKVT--SWYVALKRTGYKLGSKT 180
QY 178 YLAWTDGLLYGSGTNEECFLERLEENHYIYISKKHAENWFVGLAKNGSKRGPR 237
Db 181 GPQKAILFLPMSAKS 196
QY 238 HYGOKAILFLPLVSS 253

RESULT 2
ID Q77767 PRELIMINARY; PRT; 130 AA.
AC Q77767;
DT 01-NOV-1998 (TREMELrel. 08, Created)
DT 01-NOV-1998 (TREMELrel. 08, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
GN BFGF.
OS Canis familiaris (Dog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
Eutheria; Carnivora; Fissipedia; Canidae; Canis.
[1]
RP SEQUENCE FROM N.A.
RC TISSUE-ADRENAL GLAND;
RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;
RT "The role of bFGF in canine Hemangiosarcoma";
RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF060562; AAC35912.1; -;
DR HSSP; P09038; 1BFF.
DR PROSITE; PS00247; HGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1
FT NON_TER 130 130
SQ SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;

Query Match 28.2%; Score 511; DB 6; Length 130;
Best Local Similarity 55.3%; Pred. No. 1.14e-93;
Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;
Db 1 FKDPKLYCKNGGFFRIHPDGRVDGVRKSDPHVQLQAEERGVVSGKVCANRYLAM 60
QY 122 YKPKLLYCSNGGHFLRILPDGVTDRSDQHILQLSAESVGEVYIKSTGTGYLAM 181
Db 61 KEDGRLLASCVTDCEFFERLESNNYTYRSKYS--SWYVALKRTGYKLGPKTPGQ 118
QY 182 DTGLYGSQTPNEECFLERLEENHYIYISKKHAENWFVGLKNGSKRGPRTHYGQ 241
Db 119 KAILFLPMSAKS 130
QY 242 KAILFLPLVSS 253

RESULT 3
ID Q35988 PRELIMINARY; PRT; 198 AA.
AC Q35988;
DT 01-JAN-1998 (TREMELrel. 05, Created)
DT 01-JAN-1998 (TREMELrel. 05, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE RYUDOCAN CORE PROTEIN PRECURSOR.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RP SEQUENCE FROM N.A.
RC STRAIN-C3H/AN, AND 129SVJ;
RX MEDLINE; 97420681.
RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;
RT "Molecular cloning, genomic organization, promoter activity, and
tissue-specific expression of the mouse ryudocan gene";
RL J. Biochem. 122:117-24(1997).
CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN
CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO
CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.

DR EMBL; D89571; BAA22135.1; -;
DR EMBL; D89572; BAA22136.1; -;
DR PROSITE; PS00964; SYNDECAN; 1.
DR PFAM; PF01034; Syndecan; 1.
KW Signal; Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein.
FT SIGNAL 1 23 POTENTIAL.
FT CHAIN 24 198 POTENTIAL.
SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;

Query Match 27.9%; Score 505; DB 11; Length 198;
Best Local Similarity 72.4%; Pred. No. 3.47e-92;
Matches 89; Conservative 13; Mismatches 12; Indels 9; Gaps 6;
Db 1 MAPACLLAPLLLLLGGFPLVPGESIRETEVIDPDQLLEGRYFSGALPDDEDA-G-G--S 56
QY 1 MAPARLFA-LLLLFFVGG---VA-ESIRETEVIDPDQLLEGRYFSGALPDDEVDVGGQES 55
Db 57 DDFELSGSGDLDDTEEPFPFPEVIEPLVDNHPENQAPGIRVPSEPKLENEVIPKR 116
QY 56 DDFELSGSGDLDDLEDSMIGPEVHVPLVDNHPERAGSGSQVTEPKKLENEVIPKR 115
Db 117 APS 119
QY 116 ISP 118

RESULT 4
ID P79706 PRELIMINARY; PRT; 101 AA.
AC P79706;
DT 01-MAY-1997 (TREMELrel. 03, Created)
DT 01-MAY-1997 (TREMELrel. 03, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE BASIC FGF (FRAGMENT).
OS Cynops pyrrhogaster (Japanese common newt).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroides; Salamandridae; Cynops.
[1]
RP SEQUENCE FROM N.A.
RC TISSUE-EMBRYO;
RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
RA KANEDA T.;
RT "Serial expression of the genes in a mesodermatizing ectoderms of
early Cynops gastrula";
RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; D89443; BAAL3958.1; -;
DR HSSP; P09038; 2BFH.
DR PROSITE; PS00247; HGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1
FT NON_TER 101 101
SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;

Query Match 21.1%; Score 382; DB 13; Length 101;
Best Local Similarity 53.4%; Pred. No. 3.14e-62;
Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;
Db 1 PRLYCKNGGFFLRINSCKVDGAREKSDSYIKLQLOAEERGVVSGKVCANRYLAMKDD 60
QY 125 PRLYCSNGGHFLRILPDGVTDRSDQHILQLSAESVGEVYIKSTGTGYLAMTD 184
Db 61 GRMLAKWTDDCEFFERLESNNYTYRSKYS--WYVALKR 101
QY 185 GLLYGSQTPNEECFLERLEENHYIYISKKHAENWFVGLAK 227
RESULT 5
ID Q07659 PRELIMINARY; PRT; 146 AA.
AC Q07659;
DT 01-NOV-1996 (TREMELrel. 01, Created)
DT 01-NOV-1996 (TREMELrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR.
GN BFGF.

OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 93246053.
 RA BORJA A.Z., ZELLER R., MEIJERS C.;
 RT "Expression of alternatively spliced bFGF first coding exons and
 RT antisense mRNAs during chicken embryogenesis.";
 RL Dev. Biol. 157:110-118(1993).
 RN [2]
 RP SEQUENCE OF 52-85 FROM N.A.
 RX MEDLINE; 90382254.
 RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;
 RT "Fibroblast growth factor during mesoderm induction in the early chick
 RT embryo".
 RL Development 109:387-393(1990).
 DR EMBL; M95706; AAA48616.1; -.
 EMBL; X56804; CAA40139.1; -.
 HSP; P09038; 2BFH.
 PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;
 Query Match 19.1%; Score 346; DB 13; Length 146;
 Best Local Similarity 48.1%; Pred. No. 1.15e-53;
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;
 Db 45 ERYSAVMKIQQAERGVSIVKGSANRFLANKEDGRLLKATCECFERLESNNYN 104
 QY 150 DRSDQHIQLQSAESVGEVIKSTETQGYLAMTDGLLYGSDTPNECLFLERLEENHYN 209
 Db 105 TVRSKRYSD--WYVALKRTGQVKGPKTGPQKAILFLPSAKS 146
 QY 210 TVSKKHAENKFWGLKNGSKRGKRPRTYHGYKAILFLPLVSS 253
 RESULT 6
 ID Q60487 PRELIMINARY; PRT; 115 AA.
 AC Q60487;
 DT 01-NOV-1996 (TRENBLrel. 01, Created)
 DT 01-NOV-1996 (TRENBLrel. 01, Last sequence update)
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 OS Cavia porcellus (Guinea pig).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
 OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX TISSUE-PROSTATE;
 RA RICCIARDELLI C.;
 RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.
 DR EMBL; L75974; AAA85394.1; -.
 DR HSP; P09038; 2BFH.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 FT NON_TER
 SQ SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;
 Query Match 17.3%; Score 313; DB 11; Length 115;
 Best Local Similarity 44.6%; Pred. No. 6.33e-46;
 Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;
 Db 1 GFFLRTHPGRDVGRKTPDHPIKHNKPKA-EELCYQGSLSNRYLAMKEDGRLLASKCV 59
 QY 134 GHFLRLPDGTVGTRDRSDQHIQLQSAESVGEVIKSTETQGYLAMTDGLLYGSQTP 193
 Db 60 TDCFFERLESNNYTYRSKYS--SWYVALKRTQYKLG 98
 QY 194 NEECFLERLEENHYNITYISKKHAENKFWGLKNGSKRG 234

RESULT 7
 ID P79150 PRELIMINARY; PRT; 194 AA.
 AC P79150;
 DT 01-MAY-1997 (TRENBLrel. 03, Created)
 DT 01-MAY-1997 (TRENBLrel. 03, Last sequence update)
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
 DE KERATINOCYTE GROWTH FACTOR.
 OS Canis familiaris (Dog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
 OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 96226403.
 RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,
 RA BRUEGGEMEIER R.W., LIN Y.C.;
 RT "Keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine
 RT prostate: molecular cloning of mRNA encoding canine KGF.";
 RL DNA Cell Biol. 15:247-254(1996).
 DR EMBL; U08000; AAB38972.1; -.
 DR HSP; P05230; 2AFG.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 DR PRINTS; PR00263; HBGF_FGF.
 SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;
 Query Match 16.6%; Score 301; DB 6; Length 194;
 Best Local Similarity 38.6%; Pred. No. 3.85e-43;
 Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;
 Db 69 LFCRTQ-WYLRIDKRGKVGKTOEMKSNINMIRVAVGIVAIGKVESEYLLAMNKEGKL 127
 QY 128 LYCSNGGHEFLRLPDGTVGTRDRSDQHIQLQSAESVGEVIKSTETQGYLAMTDGLL 187
 Db 128 YAKKEGNCEDNFKLEILNHNHYTASAKWTHSGGEMFVALNOKGVVPVKKTKKEQKTAH 187
 QY 188 YGSQTPNECLFLERLEENHYNITYIS-K-KHAENKFWGLKNGSKRGKRPRTYHGYKAIL 245
 Db 188 FLPMAT 194
 QY 246 FLPLPVS 252
 RESULT 8
 ID Q42407 PRELIMINARY; PRT; 212 AA.
 AC Q42407;
 DT 01-JAN-1998 (TRENBLrel. 05, Created)
 DT 01-JUN-1998 (TRENBLrel. 06, Last sequence update)
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
 DE FIBROBLAST GROWTH FACTOR 10.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 97330690.
 RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,
 RA YOSHIOKA H., KIWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;
 RT "The mesenchymal factor, FGF10, initiates and maintains the outgrowth
 RT of the chick limb bud through interaction with FGF8, an apical
 RT ectodermal factor.";
 RL Development 124:2235-2244(1997).
 DR EMBL; D86333; BAA24945.1; -.
 DR HSP; P03968; IBAR.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00263; HBGF_FGF.
 SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;
 Query Match 15.9%; Score 289; DB 13; Length 212;
 Best Local Similarity 39.1%; Pred. No. 2.24e-40;
 Matches 52; Conservative 26; Mismatches 51; Indels 4; Gaps 4;
 Db 82 RKRKL-Y-SYNYFLKIEKNGKVSCTKENCPSILEITSVEIGVAVKSIKSNYYLAWN 139

Search completed: Tue Aug 29 15:58:33 2000
Job time : 64 secs.



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W O R L D

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Mpsrch_pp protein - protein database search, using Smith-Waterman algorithm

On: Tue Aug 29 16:06:12 2000; MasPar time 9.50 Seconds
700.535 Million cell updates/sec

Tabular output not generated.

Title: >US-09-121-017B-23
Description: (1-281) from US09121017B.pep
Perfect Score: 1980
Sequence: 1 MAPARLALLFFVGVGAES.....PRTHYGKAILFLPLPVSSD 281

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: a-geneseq36
1:geneseqp

Statistics: Mean 33.230; Variance 150.315; scale 0.221

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				Pred. No.	
Result No.	Score	Query Match	Description	ID	Pred. No.
1	984	49.7	Human acidic fibroblas	R25914	3.21e-78
2	984	49.7	Human acidic fibroblas	R34497	3.21e-78
3	984	49.7	Human acid fibroblast	P90068	3.21e-78
4	984	49.7	Human recombinant aFGF	R74647	3.21e-78
5	984	49.7	Human acidic fibroblas	W04806	3.21e-78
6	984	49.7	Sequence of human prot	P70995	3.21e-78
7	984	49.7	Human acidic fibroblas	R10527	3.21e-78
8	984	49.7	Human aFGF encoded by	R05789	3.21e-78
9	984	49.7	Human beta-endothelial	W92283	3.21e-78
10	984	49.7	Human beta-endothelial	W04805	3.21e-78
11	984	49.7	Human endothelial cell	W06816	3.21e-78
12	984	49.7	Human beta-endothelial	W75414	3.21e-78
13	984	49.7	Human acidic fibroblas	P94037	3.21e-78
14	984	49.7	FGF-1.	R70812	3.21e-78
15	984	49.7	Sequence encoded by co	P70482	3.21e-78
16	984	49.7	Fibroblast growth fact	R80776	3.21e-78
17	984	49.7	Fibroblast growth fact	W53022	3.21e-78
18	984	49.7	Fibroblast growth fact	W57111	3.21e-78
19	984	49.7	Human endothelial cell	W75415	3.21e-78
20	984	49.7	Human endothelial cell	W92291	3.21e-78
21	984	49.7	Human BCGF encoded by	R05785	3.21e-78
22	984	49.7	Human endothelial cell	W06818	3.21e-78
23	983	49.6	Human alpha-endothelia	W75413	3.98e-78

ALIGNMENTS

RESULT 1		ID R25914 standard; peptide; 140 AA.	
AC	R25914;	DT	26-JAN-1993 (first entry)
DE	Human acidic fibroblast growth factor.	KW	herpes varicella; herpes simplex virus; HSV-1; HSV-2;
KW	herpes varicella; herpes simplex virus; HSV-1; HSV-2;	KW	human respiratory syncytial virus; Semliki Forest virus; HIV;
KW	human immunodeficiency virus; Moloney Sarcoma virus.	OS	Homo sapiens.
PN	EP-497341-A.	PN	05-AUG-1992.
PD	05-AUG-1992.	PF	31-JAN-1992; 101541.
PR	31-JAN-1991; GB-002145.	PR	09-JAN-1992; GB-000410.
PA	(FARM) FARMITALIA ERGA SRL CARLO.	PI	Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;
PT	WPI: 92-260792/32.	PT	Synergistic antiviral composition contains BFGF and sulphated
PT	Polysaccharide - for treating viral infections e.g. HSV-1 and -2,	PS	cytomegalovirus, HIV, influenza virus etc.
PS	Disclosure; Page 4; 20pp; English.	CC	This sequence represents acidic fibroblast growth factor (aFGF).
CC	aFGF, or its fragments may be used in a synergistic compsn. with an	CC	antivirally active sulphated polysaccharide, and one or more
CC	excipients. The compsn. may be used to control herpes simplex virus	CC	(HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;
CC	human respiratory syncytial virus; Semliki Forest virus; HIV or	CC	Moloney Sarcoma virus. The combination of aFGF with sulphated
CC	polysaccharide is found to have a greater antiviral activity than	CC	expected for an additive effect. See also R25913-5.
CC	Sequence 140 AA;	QY	Query Match 49.7%; Score 984; DB 1; Length 140;
QY	Best Local Similarity 99.3%; Pred. No. 3.21e-78;	QY	Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db	6 GNYKKPLLYCSNGHFLRLPDGTVDRSDQIQLQLSAESVGEYIKSTETGOYL 65		
Qy	147 ANYKKPLLYCSNGHFLRLPDGTVDRSDQIQLQLSAESVGEYIKSTETGOYL 206		
Db	66 AMDTDGLLYGSQTNECLFLERLEENHYNTYISKKAENKWNFVGLKNGSKCRGPRTY 125		
Qy	207 AMDTDGLLYGSQTNECLFLERLEENHYNTYISKKAENKWNFVGLKNGSKCRGPRTY 266		
Db	126 GQKAILFLPLPVSSD 140		

QY 267 GOKAILFLPLPVSSD 281

RESULT 2

ID R34497; standard; protein; 140 AA.
AC R34497;
DE 06-AUG-1993 (first entry)
DE Human acidic fibroblast growth factor.
KW aFGF; mutin; glycosylation site; glycoprotein.
OS Homo sapiens.
PN J05076356-A.

PF 30-MAR-1993.
PF 30-MAY-1991; 127435.
PR 31-MAY-1990; JP-143388.
PA (TAKE) TAKEDA CHEM IND LTD.
DR WPI; 93-139564/17.
PT FGF mutin prepn. useful for therapy of burn or thrombosis - by
PT transformation of lymphocyte-contained animal cell by vector
PT contg. DNA encoding FGF mutin
PT Disclosure; Page 3; 23pp; Japanese.
CC The invention covers mutants of FGF (esp. bFGF) which contain at
CC least one glycosylation site. The mutants can be used to treat burns
CC and thrombosis.
SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 65
:|||||

QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 206

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 125
:|||||

QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266

Db 126 GOKAILFLPLPVSSD 140
:|||||

QY 267 GOKAILFLPLPVSSD 281

RESULT 3

ID P90068; standard; protein; 140 AA.
AC P90068;
DE 1-NOV-1989 (first entry)
DE Human acid fibroblast growth factor
KW Human acid fibroblast growth factor; mutant.
EP-319052-A.
14-JUN-1989.

PF 14-OCT-1988; 202306.
PR 22-OCT-1987; EP-244431.
PA (MERI) Merck and Co.
PI Thomas Jnr KA, Linemeyer DL;
DR WPI; 89-167092/23.
PT Mutant acidic fibroblast growth factor
PT - used for promoting repair of soft tissue, musculoskeletal
PT tissue or vascular or nerve tissue and plasminogen
PT activator prodn.
PS Disclosure; page 4; 36pp; English.
CC Amino acid sequence of human acidic fibroblast growth
CC factor (aFGF). The patent claims mutant forms which have
CC increased biological activity with(out) heparin, and promote
CC cell growth.
SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 65
:|||||

QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 206

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 125
:|||||

QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266

Db 126 GOKAILFLPLPVSSD 140
:|||||

QY 267 GOKAILFLPLPVSSD 281

RESULT 4

ID R74647; standard; protein; 140 AA.
AC R74647;
DT 25-SEP-1995 (first entry)
DE Human recombinant aFGF.
KW Acidic fibroblast growth factor; aFGF; vulnary; angiogenesis;
KW mitogen.
OS Homo sapiens.
PN US5401832-A.

PD 28-MAR-1995; 685923.
PF 24-DEC-1984; US-685923.
PR 12-SEP-1985; US-774359.
PR 30-MAY-1986; US-868473.
PR 11-JUL-1986; US-884460.
PR 04-JUN-1987; US-054991.
PR 04-MAY-1988; US-190293.
PR 08-FEB-1991; US-765472.
PR 25-SEP-1991; US-951365.
PR 25-SEP-1992; US-951365.
PA (MERI) MERCK & CO INC.
PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;
DR WPI; 93-138983/18.

PT New recombinant human acidic fibroblast growth factor - used to
PT promote cell growth, to promote wound healing, for vascular
PT grafts and blood vessel repair
PS Claim 2; Column 30; 25pp; English.
CC Oligonucleotides were synthesized on the basis of the amino acid
CC sequence of bovine acidic fibroblast growth factor (aFGF) and
CC used to produce a synthetic gene (given in Q88233) incorporating
CC codons preferred by E. coli or mammalian cells, unique cloning
CC sites, etc. This synthetic gene was mutagenized to obtain a gene
CC encoding a human recombinant aFGF (R74647) having activity
CC equivalent to the native protein.
SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 65
:|||||

QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 206

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 125
:|||||

QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266

Db 126 GOKAILFLPLPVSSD 140
:|||||

QY 267 GOKAILFLPLPVSSD 281

RESULT 5

ID W04806; standard; protein; 140 AA.
AC W04806;
DT 29-DEC-1996 (first entry)
DE Human acidic fibroblast growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor; ss.
OS Homo sapiens.

PN US552528-A.
 PD 03-SEP-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PA (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Maciag T;
 DR WPI: 96-412132/41.
 DR N-PSDB: T37503.
 PT Isolated, purified, biologically active bovine beta endothelial cell
 PT growth factor - useful to regenerate or treat damaged blood vessels
 PS Disclosure; Fig 8; 28pp; English.
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
 CC brain using heparin-Sepharose affinity chromatography. ECGF is
 CC useful for, among other purposes, diagnostic applications and has
 CC potential in the treatment of damaged blood vessels or other
 CC endothelial cell-lined structures.
 CC Human ECGF (T37503) or fragments may be obtained using
 CC oligonucleotides (T37504 and T37509) whose design is based
 CC on the sequence of bovine alpha- and beta-ECGF.
 SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206
 DB 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 125
 QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 266
 DB 126 GOKAILFLPLPVSSD 140
 QY 267 GOKAILFLPLPVSSD 281

RESULT 6
 ID P70995 standard; protein; 140 AA.
 AC P70995;
 DB 13-JUN-1991 (first entry)
 CC Sequence of human proteinaceous factor (PFI) with mitogenic activity.
 CC Cell growth promoter; mitogen; vascularisation; wound healing.
 CC Homo sapiens.
 FH Key Location/Qualifiers
 FT misc_difference 140
 FT /label= Asp-OH
 PN EP-241136-A.
 PD 14-OCT-1987.
 PF 06-MAR-1987; 301969.
 PR 07-MAR-1986; US-838096.
 PA (HARD) HARVARD COLLEGE.
 PI Lobb RR, Harper JW, Strydom DJ;
 DR WPI: 87-285995/41.
 PT Mitogenic polypeptide isolated from human brain tissue - useful
 PT for increasing vascular effect in eg wound healing, or
 PT generating endothelial cell linings for vascular prostheses, etc.
 PS Claim 3; Page 1; 31pp; English.
 CC The PF of the invention was obtd. from human brain tissue. It has a
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
 CC affinity for heparin. PFI and fragments are useful for promoting the
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
 CC generating endothelial cell linings for vascular prostheses (all
 CC claimed). The polypeptides are useful for increasing vascularisation.
 SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206
 DB 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 125
 QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 266
 DB 126 GOKAILFLPLPVSSD 140
 QY 267 GOKAILFLPLPVSSD 281

RESULT 6
 ID P70995 standard; protein; 140 AA.
 AC P70995;
 DB 13-JUN-1991 (first entry)
 CC Sequence of human proteinaceous factor (PFI) with mitogenic activity.
 CC Cell growth promoter; mitogen; vascularisation; wound healing.
 CC Homo sapiens.
 FH Key Location/Qualifiers
 FT misc_difference 140
 FT /label= Asp-OH
 PN EP-241136-A.
 PD 14-OCT-1987.
 PF 06-MAR-1987; 301969.
 PR 07-MAR-1986; US-838096.
 PA (HARD) HARVARD COLLEGE.
 PI Lobb RR, Harper JW, Strydom DJ;
 DR WPI: 87-285995/41.
 PT Mitogenic polypeptide isolated from human brain tissue - useful
 PT for increasing vascular effect in eg wound healing, or
 PT generating endothelial cell linings for vascular prostheses, etc.
 PS Claim 3; Page 1; 31pp; English.
 CC The PF of the invention was obtd. from human brain tissue. It has a
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
 CC affinity for heparin. PFI and fragments are useful for promoting the
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
 CC generating endothelial cell linings for vascular prostheses (all
 CC claimed). The polypeptides are useful for increasing vascularisation.
 SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206
 DB 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 125
 QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 266
 DB 126 GOKAILFLPLPVSSD 140
 QY 267 GOKAILFLPLPVSSD 281

RESULT 7
 ID R10527 standard; Protein; 141 AA.
 AC R10527;
 DT 15-APR-1991 (first entry)
 DE Human acidic fibroblast growth factor gene.
 KW aFGF; antibody; antigen; cancer; ss.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT region 2..12
 FT /label= A
 FT region 56..67
 FT /label= B
 FT region 104..114
 FT /label= C
 FT region 132..141
 FT /label= D
 PN J02306996-A.
 PD 20-DEC-1990.
 PF 03-JUL-1989; 172542.
 PR 04-JUL-1988; JP-166275.
 PR 03-JUL-1989; JP-172542.
 PA (TAKE) TAKEDA CHEMICAL IND KK.
 DR WPI: 91-040150/06.
 DR N-PSDB: Q10399.
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by
 PT using complex of partial peptide(s) of acid fibroblast growth
 PT factor and protein as antigen.
 PS Disclosure; Fig 1; 19pp; Japanese.
 CC The was deduced from a gene used to produce recombinant aFGF.
 CC Peptides derived from the protein, esp. from A-D can be used to as
 CC antigens to produce anti-aFGF antibodies. The peptides must
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,
 CC and for purifying aFGF. They are useful as reagents in the diag-
 CC nosis of various cancers or diseases of the CNS. Purified aFGF
 CC has wound healing and nerve cell proliferating properties.
 SQ Sequence 141 AA;

Query Match 49.7%; Score 984; DB 1; Length 141;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 7 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 66
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206
 DB 67 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 126
 QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNFWGLKNGSKCRGPRTHY 266
 DB 127 GOKAILFLPLPVSSD 141
 QY 267 GOKAILFLPLPVSSD 281

RESULT 8

R05789 standard; Protein; 151 AA.
AC R05789;
DT 22-AUG-1990 (first entry)
DE Human aFGF encoded by synthetic gene.
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;
KW atherosclerosis; tumors.
OS Synthetic.
FH Key
FT Location/Qualifiers
FT misc_difference 146..147
FT /note= "sites corresp. to two stop codons of
FT the DNA sequence"
FT
FN GB223496-A.
PD 11-APR-1990.
PF 08-AUG-1988; 018775.
PR 08-AUG-1988; GB-018775.
PA (BRBI-) Brit Bio-Tech Ltd.
PI Davies JA, Johnson ID;
DR WPI; 90-109882/15.
DR N-PSDB; Q03873.
PS Gene encoding human acidic fibroblast growth factor -
PS incorporates useful restriction sites at frequent intervals to
PS facilitate cassette mutagenesis of specified regions.
PS Claim 2; Fig 3a; 12pp; English.
CC The synthetic aFGF gene incorporates useful restriction sites at
CC frequent intervals to facilitate the cassette mutagenesis of
CC selected regions. Also included are flanking sites to simplify
CC the incorporation of the gene into any expression system.
CC The aFGF mol. acts in a cascade effect to control endothelial cell
CC activity either co-ordinately through synergistic effects or via
CC independent routes. The regulation of endothelial cells is essential
CC for the protection of arteries, veins and capillaries from the effect
CC of thrombogenesis. Their stimulation and control by these factors is
CC also thought to be important in the development of tumours and
CC atherosclerosis.
SQ Sequence 151 AA;

Query Match 49.7%; Score 984; DB 1; Length 151;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 11 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVIKSTGTQYL 70
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVIKSTGTQYL 206
DB 71 AMDTDGLYSGQTPNEECFLERLEENHYNTYISKKAENWVFLKKNKSGCKRGRPTHY 130
QY 207 AMDTDGLYSGQTPNEECFLERLEENHYNTYISKKAENWVFLKKNKSGCKRGRPTHY 266
131 GOKAILFLPLPVSSD 145
267 GOKAILFLPLPVSSD 281

RESULT 9
ID W92283 standard; protein; 154 AA.
AC W92283;
DT 20-APR-1999 (first entry)
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
KW regenerate; blood vessel; endothelial cell; human.
OS Homo sapiens.
PN US5849538-A.
PD 15-DEC-1998.
PF 11-APR-1997; 840088.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 11-JUN-1995; US-472964.
PR 11-APR-1997; US-840088.
PA (RHON) RHONE-POULENC RORER PHARM INC.

Query Match 49.7%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVIKSTGTQYL 79
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVIKSTGTQYL 206
DB 80 AMDTDGLYSGQTPNEECFLERLEENHYNTYISKKAENWVFLKKNKSGCKRGRPTHY 139
QY 207 AMDTDGLYSGQTPNEECFLERLEENHYNTYISKKAENWVFLKKNKSGCKRGRPTHY 266
140 GOKAILFLPLPVSSD 154
267 GOKAILFLPLPVSSD 281

RESULT 10
ID W04805 standard; Protein; 154 AA.
AC W04805;
DT 29-DEC-1996 (first entry)
DE Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI; 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PS Disclosure; Fig 8; 28pp; English.
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 154 AA;

Query Match 49.7%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVIKSTGTQYL 79
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVIKSTGTQYL 206
DB 80 AMDTDGLYSGQTPNEECFLERLEENHYNTYISKKAENWVFLKKNKSGCKRGRPTHY 139
QY 207 AMDTDGLYSGQTPNEECFLERLEENHYNTYISKKAENWVFLKKNKSGCKRGRPTHY 266
140 GOKAILFLPLPVSSD 154
267 GOKAILFLPLPVSSD 281

QY 147 ANYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 206
 Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139
 :|||||
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266
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 Db 140 GQRAILFLPLPVSSD 154
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 QY 267 GQRAILFLPLPVSSD 281
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RESULT 11
 ID W06816 standard; Protein; 154 AA.
 AC W06816;
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor-beta.
 KW Endothelial cell growth factor-beta; ECGF-beta.
 OS Homo sapiens.
 US5571790-A.
 05-NOV-1996.
 03-MAR-1986; 835594.
 03-MAR-1986; US-835594.
 18-DEC-1987; US-134499.
 29-APR-1991; US-693079.
 27-NOV-1991; US-799859.
 03-NOV-1994; US-334884.
 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, MacIag T;
 DR WPI; 96-503421/50.
 DR N-PSDB; T45983.
 PT Recombinant human endothelial cell growth factors - for treating
 PS damaged blood vessels, etc.
 PS Claim 1: Column 16; 22pp; English.
 CC Human recombinant endothelial cell growth factors (ECGF) beta
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
 CC They can be produced in transformed prokaryotic or eukaryotic host
 CC cells using DNA sequences (T45983 and T45984, respectively) derived
 CC from the complete human ECGF cDNA (T45985). Large quantities of
 CC the ECGFs are produced by culturing the host cells and recovering
 CC the proteins. ECGFs have utility in the growth and amplification
 CC of endothelial cells in culture. They can potentially be used to
 CC treat damaged blood vessels and other endothelial cell-lined
 CC structures, and also have diagnostic applns.
 SQ Sequence 154 AA;

Query Match 49.7%; Score 984; DB 1; Length 154;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 79
 :|||||
 QY 147 ANYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 206
 :|||||

Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139
 :|||||
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266
 :|||||

Db 140 GQRAILFLPLPVSSD 154
 :|||||
 QY 267 GQRAILFLPLPVSSD 281
 :|||||

RESULT 12
 ID W75414 standard; protein; 154 AA.
 AC W75414;
 DT 02-MAR-1999 (first entry)
 DE Human beta-endothelial cell growth factor.
 KW Human beta-endothelial cell growth factor; ECGF; brain stem; probe;
 KW hybridisation; bovine; wound healing; prosthetic device.
 OS Homo sapiens.
 PN US5827826-A.
 27-OCT-1998.

Query Match 49.7%; Score 984; DB 1; Length 154;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 79
 :|||||
 QY 147 ANYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 206
 :|||||

Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139
 :|||||
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266
 :|||||

Db 140 GQRAILFLPLPVSSD 154
 :|||||
 QY 267 GQRAILFLPLPVSSD 281
 :|||||

PF 04-NOV-1996; 743261.
 PR 04-NOV-1996; US-743261.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, MacIag T;
 DR WPI; 98-594032/50.
 DR Compositions for promoting wound healing - containing endothelial
 PT cell growth factor polypeptides
 PS Claim 1: Column 16; 23pp; English.
 CC This sequence represents the amino acid sequence of the mature human
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
 CC is identical to the alpha-ECGF but the beta sequence contains an extra
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain
 CC stem cell cDNA library using a probe designed based on fragments of the
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
 CC compositions for promoting wound healing. ECGF is also used to grow
 CC cells on a prosthetic device.
 SQ Sequence 154 AA;

Query Match 49.7%; Score 984; DB 1; Length 154;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 79
 :|||||
 QY 147 ANYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 206
 :|||||

Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139
 :|||||
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266
 :|||||

Db 140 GQRAILFLPLPVSSD 154
 :|||||
 QY 267 GQRAILFLPLPVSSD 281
 :|||||

RESULT 13
 ID P94037 standard; protein; 155 AA.
 AC P94037;
 DT 25-JUN-1990 (first entry)
 DE Human acidic fibroblast growth factor.
 KW Acidic fibroblast growth factor.
 OS Homo sapiens.
 PN EP-298723-A.
 PD 11-JAN-1989.
 PF 06-JUL-1988; 306158.
 PR 07-JUL-1987; US-070797.
 PA (BIOT-) Biotechn Res Assoc.
 PI Fiddes JC, Abraham JA, Protter A;
 DR WPI; 89-009785/02.
 DR N-PSDB; N93088.
 PT Recombinant DNA encoding new fibroblast growth factor
 PT analogues - useful eg for accelerating wound healing and
 PT to control neovascularisation.
 PS Disclosure; p; English.
 CC See also P94038.
 SQ Sequence 155 AA;

Query Match 49.7%; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 80
 :|||||
 QY 147 ANYKKPILLYCSNGHFLRILPDGTVDGTRDRSDQHIQOLSAESVGEVYIKSTETGOYL 206
 :|||||

Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 140
 :|||||

QY 207 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 266
Db 141 GOKAILFLPLPVSSD 155
QY 267 GOKAILFLPLPVSSD 281

RESULT 14

ID R70812 standard; protein; 155 AA.
AC R70812;
DT 01-SEP-1995 (first entry)
DE FGF-1.
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
OS Homo sapiens. Location/Qualifiers
FH Key misc_difference 31
FT misc_difference 132 /note= "Cys may be replaced by Ser"
FT misc_difference 132 /note= "Cys may be replaced by Ser"
W09503831-A.
09-FEB-1995.
27-JUL-1994; U08511.
PR 02-AUG-1993; US-099924.
PR 29-OCT-1993; US-145829.
PA (PRIZ-) PRIZM PHARM INC.
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
PI Baird AJ, Leppl DA, Sosnowski BA;
DR WPI; 95-082038/11.
PT New monogenous preparations of cytotoxic conjugates and DNA -
PT contain fibroblast growth factors and cytotoxic agents for
PT treating FGF conditions such as tumours, diabetes and rheumatoid
PT arthritis.
PS Disclosure; Page 108-109; 128pp; English.
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or
CC FGF-8 (R70815) mutelns, in which at least 1 Cys residue is replaced
CC by conservative Ser substitutions. The fusion proteins are potent
CC cytotoxic agents to cells bearing the FGF receptor.
SQ Sequence 155 AA;

Query Match 49.7%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPLLYCSNGGHFLRLPDGTVDRSDQHLOLSAESVGEVYIKSTETGOYL 80
QY 147 ANYKKPLLYCSNGGHFLRLPDGTVDRSDQHLOLSAESVGEVYIKSTETGOYL 206
81 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 140
QY 207 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 266
Db 141 GOKAILFLPLPVSSD 155
QY 267 GOKAILFLPLPVSSD 281

RESULT 15

ID P70482 standard; Protein; 155 AA.
AC P70482;
DT 13-MAY-1991 (first entry)
DE Sequence encoded by complete cDNA sequence of human endothelial
DE cell growth factor (ECGF).
KW Endothelial cell regeneration; blood vessel regeneration.
OS Homo sapiens.
FH Key Location/Qualifiers
FT protein 2..15
FT /label= Beta ECGF
FT protein 16..21
FT /label= Acidic FGF
FT protein 22..155
FT /label= Alpha ECGF

PN W08705332-A.
PD 11-SEP-1987.
PF 02-MAR-1987; U00425.
PR 03-MAR-1986; US-835594.
PR 26-MAR-1987; ES-000812.
PA (MELO-) MELOY LAB INC.
PA (RORE-) RORER BIOTECHN INC.
PA (RORE-) RORER.
PA BIOTECH INC.
PI Jaye M, Burgess W, Maciag T, Drohan W;
DR WPI; 87-264128/37.
DR N-PSDB; N70788
PT Human endothelial cell growth factor - produced by recombinant
PT DNA techniques, useful for wound healing
PS Example; Fig 8; 43pp; English.
CC To screen the human brain stem cDNA library for clones contg. ECGF
CC inserts, a specific oligonucleotide was designed. This
CC oligonucleotide was based upon a partial AA sequence analysis of
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
CC forth for comparison the AA sequence of cyanogen bromide-cleaved
CC bovine alpha and beta ECGF (P70834). The two clones that were
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
CC nucleotide sequence of these clones and the AA sequence deduced from
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
SQ Sequence 155 AA;

Query Match 49.7%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 3.21e-78;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPLLYCSNGGHFLRLPDGTVDRSDQHLOLSAESVGEVYIKSTETGOYL 80
QY 147 ANYKKPLLYCSNGGHFLRLPDGTVDRSDQHLOLSAESVGEVYIKSTETGOYL 206
81 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 140
QY 207 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 266
Db 141 GOKAILFLPLPVSSD 155
QY 267 GOKAILFLPLPVSSD 281

Search completed: Tue Aug 29 16:06:43 2000
Job time : 31 secs.

(TM)

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MasPar time 15.90 Seconds
833.849 Million cell upda

.....PRTHYGQKAILFLPLPVSSD 281

142080 seqs, 47172406 residues

Mean 46.699; Variance 90.971; scale 0.513

and is derived by analysis of the total score distribution.

Cult No.	Query Match	Score	Length	DB	ID	Description	Pred. No.
1	50.2	993	198	2	JC1457	ryudocan precursor--	4.09e-17
2	49.7	984	155	1	A33665	acidic fibroblast gro	3.37e-17
3	48.8	967	155	1	A60721	acidic fibroblast gro	1.39e-17
4	46.7	967	155	2	S04147	acidic fibroblast gro	1.39e-17
5	48.8	967	155	2	D37360	acidic fibroblast gro	1.39e-17
6	953	963	152	2	JH0476	acidic fibroblast gro	1.32e-16
7	918	964	155	1	GK80A	acidic fibroblast gro	3.55e-16
8	917	963	155	2	A60130	acidic fibroblast gro	5.79e-16
9	907	958	155	2	JW0035	acidic fibroblast gro	7.64e-15
10	679	34.3	202	2	A42410	fibroblast growth fac	7.64e-15
11	642	32.4	198	2	JC5613	ryudocan precursor -	6.30e-11
12	522	26.4	189	2	A48834	ryudocan precursor -	3.40e-11
13	516	26.1	146	1	S00185	basic fibroblast grow	1.66e-78
14	516	26.1	157	1	GK80B	basic fibroblast grow	2.77e-77
15	508	25.7	154	2	A33674	basic fibroblast grow	2.77e-77
16	508	25.7	154	2	C37360	basic fibroblast grow	1.18e-75
17	509	25.7	210	2	A32398	basic fibroblast grow	1.18e-75
18	498	25.2	164	2	S31622	basic fibroblast grow	7.38e-76
19	489	24.7	155	1	A40117	basic fibroblast grow	1.27e-73
20	466	23.5	137	2	I47111	basic fibroblast grow	8.48e-72
21	351	17.7	208	2	A48137	fibroblast growth fac	3.78e-67
22	351	17.7	208	2	S65486	fibroblast growth fac	2.53e-44
23	329	16.6	207	2	JC5941	fibroblast growth fac	2.53e-44
24	329	16.6	207	2	JC5941	fibroblast growth fac	4.64e-40

MasPar time 15.90 Seconds
833.849 Million cell upda

RESULT	1
ENTRY	JC1457
TITLE	ryudocan precursor - human
ALTERNATE_NAMES	amphiglycan; core protein
ORGANISM	#formal_name Homo sapiens
DATE	30-Sep-1993 #sequence revision

ACCESSIONS	UC1457, 520035
REFERENCE	JC1457

Mean 46.699; Variance 90.971; scale 0.513

and is derived by analysis of the total score distribution.

Cult No.	Query Match	Score	Length	DB	ID	Description	Pred. No.
1	50.2	993	198	2	JC1457	ryudocan precursor--	4. 09e-17
2	49.7	984	155	1	A33665	acidic fibroblast gro	3.37e-17
3	48.8	967	155	1	A60721	acidic fibroblast gro	1.39e-17
4	46.7	967	155	2	S04147	acidic fibroblast gro	1.39e-17
5	48.8	967	155	2	D37360	acidic fibroblast gro	1.39e-17
6	48.1	953	152	2	JH0476	acidic fibroblast gro	1.32e-16
7	46.4	965	151	1	GK80A	acidic fibroblast gro	3.55e-16
8	46.3	917	155	2	A60130	acidic fibroblast gro	5.79e-16
9	45.8	907	155	2	JW0035	acidic fibroblast gro	7.64e-15
10	34.3	679	202	2	A42410	fibroblast growth fac	7.64e-15
11	642	692	198	2	JC5613	ryudocan precursor -	6.30e-11
12	52.2	522	189	2	A48834	basic fibroblast grow	1.66e-78
13	26.1	516	146	1	S00185	basic fibroblast grow	2.77e-77
14	26.1	516	157	1	GK80B	basic fibroblast grow	2.77e-77
15	508	508	154	2	A33674	basic fibroblast grow	1.18e-75
16	508	508	257	2	C37360	basic fibroblast grow	1.18e-75
17	509	25.7	210	2	A32398	basic fibroblast grow	7.38e-76
18	498	25.2	164	2	S31622	basic fibroblast grow	1.27e-73
19	489	24.7	155	1	A40117	basic fibroblast grow	8.48e-72
20	466	23.5	137	2	I47111	fibroblast growth fac	3.78e-67
21	351	17.7	208	2	A48137	fibroblast growth fac	2.53e-44
22	351	17.7	208	2	S65486	fibroblast growth fac	2.53e-44
23	329	16.6	207	2	JC5941	fibroblast growth fac	4.64e-40

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Best Local Similarity 100.0%; Pred. No. 4,096-177;
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#residues 16-47 #label GI2
#experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#authors
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession A24301
#molecule_type protein
#residues 16-30,'X',32-49 #label GAU
REFERENCE
A26386
Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#authors
#journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession A26386
#molecule_type protein
#residues 16-155 #label GA2
#experimental_source brain
REFERENCE
A53639
Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
#molecule_type protein
#residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
133-140,'X',142-152 #label CHA
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#gene GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
16-155 #product fibroblast growth factor 1 #status experimental
129 #label MAT\
#binding_site carbohydrate (Asn) (covalent) #status
absent
#length 155 #molecular-weight 17460 #checksum 9243
#MARY
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Best Local Similarity 99.3%; Pred. No. 3.37e-175;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGQYL 80
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QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGQYL 206
:|||||
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAENWVGLKKNKSGCKRGPRTHY 140
:|||||
QY 207 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAENWVGLKKNKSGCKRGPRTHY 266
:|||||
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#accession A26386
#molecule_type protein
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REFERENCE
A53639
Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
#molecule_type protein
#residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
133-140,'X',142-152 #label CHA

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10-Sep-1999
ACCESSIONS
A60721
REFERENCE
#authors
Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
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CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573
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Best Local Similarity 97.0%; Pred. No. 1.39e-171;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGQYL 80
:|||||
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGQYL 206
:|||||
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAENWVGLKKNKSGCKRGPRTHY 140
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QY 207 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAENWVGLKKNKSGCKRGPRTHY 266
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Db 141 GQKAILFLPLPVSSD 155
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QY 267 GQKAILFLPLPVSSD 281
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RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS
S04147
REFERENCE
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341
Query Match 48.8%; Score 967; DB 2; Length 155;
Best Local Similarity 95.6%; Pred. No. 1.39e-171;
Matches 130; Conservative 4; Mismatches 2; Indels 0; Gaps 0;
Db 20 LGNYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGQY 79
:|||||
QY 146 VANYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGQY 205
:|||||
Db 80 LAMDTGLLYGSQTPNEECFLERLEENHNYTYSKKHAENWVGLKKNKSGCKRGPRTHY 139
:|||||
QY 206 LAMDTGLLYGSQTPNEECFLERLEENHNYTYSKKHAENWVGLKKNKSGCKRGPRTHY 265
:|||||
Db 140 YQKAILFLPLPVSSD 155
:|||||
QY 266 YQKAILFLPLPVSSD 281
:|||||

```

```

RESULT 3
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change

```

```

RESULT 5
ENTRY
TITLE
ALTERNATE_NAMES
ORGANISM
DATE
ACCESSIONS
REFERENCE
#authors
#journal
#title
#cross-references EMBL:90201563
#accession
#status
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE
#authors
#journal
#title
#cross-references MUID:97128312
#accession
#status
#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
disease including atherosclerosis, cancer and inflammatory
autoimmune disease.
GENETICS
#gene
#introns
CLASSIFICATION
SUMMARY
Query Match 48.8%; Score 967; DB 2; Length 155;
Best Local Similarity 95.6%; Pred. No. 1.39e-171;
Matches 130; Conservative 4; Mismatches 2; Indels 0; Gaps 0;
Db 20 LGNYKPKLLYCSNGGHFLRILPDGTVDRSDQHIQLQLSAESVGEYIIKSTETGQY 79
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 146 VANYKPKLLYCSNGGHFLRILPDGTVDRSDQHIQLQLSAESVGEYIIKSTETGQY 205
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
80 LAMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKKNKSGCKRGPRTH 139
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 206 LAMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKKNKSGCKRGPRTH 265
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 140 YGQKAILFLPLVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 266 YGQKAILFLPLVSSD 281
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
RESULT 6
ENTRY
TITLE
ORGANISM
DATE
ACCESSIONS
REFERENCE
#authors
#journal
#title
#cross-references EMBL:92062117
#accession
#molecule_type mRNA
#residues 1-152 #label SCH

```

```

#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
SUMMARY #length 152 #checksum 1124
Query Match 48.1%; Score 953; DB 2; Length 152;
Best Local Similarity 97.0%; Pred. No. 1.32e-168;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
Db 21 GNYKPKLLYCSNGGHFLRILPDGTVDRSDQHIQLQLSAESVGEYIIKSTETGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 147 ANYKPKLLYCSNGGHFLRILPDGTVDRSDQHIQLQLSAESVGEYIIKSTETGQYL 206
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKKNKSGCKRGPRTH 140
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKKNKSGCKRGPRTH 266
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 141 GOKAILFLPLPV 152
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 267 GOKAILFLPLPV 278
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
RESULT 7
ENTRY
TITLE
ALTERNATE_NAMES
ORGANISM
DATE
ACCESSIONS
REFERENCE
#authors
#journal
#title
#cross-references MUID:92246990
#accession
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE
#authors
#journal
#title
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
#accession
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
#authors
#journal
#title
#cross-references EMBL:89078619
#accession
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
#accession
#molecule_type mRNA
#residues 1-155 #label J.M.
#authors

```

```

#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore, M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe, N.; Sharma, H.S.; Schnaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine, porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain: amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30,'X',32-34,'X',36-44 #label BOH
REFERENCE
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts, G.D.; Bordoli, R.S.; McKeenan, W.D.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatropin, a prostate epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2,'GE',5-155 #label CRA
REFERENCE
#authors Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.; Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918
#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor
#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor
#accession A25043
#molecule_type protein

```

```

#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor
REFERENCE
#authors Strydom, D.J.; Harper, J.W.; Lobb, R.R.
#journal Biochemistry (1986) 25:945-951
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR
REFERENCE
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.
#accession A60884
#molecule_type protein
#residues 16-155 #label THO
REFERENCE
#authors Kuo, M.D.; Huang, S.S.; Huang, J.S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30,'X',32-38 #label KU2
#note this form was designated brain-derived growth factor A
#accession B37892
#molecule_type protein
#residues 62-76,'X',78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B
REFERENCE
#authors Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.
#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26;28-50;53-110,'H',112,'NTY';134-155 #label HIL
REFERENCE
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.; Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
#journal J. Biol. Chem. (1989) 264:17606-17612
#title Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.
#cross-references MUID:9008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24;121-127;134-143 #label SAS
#experimental_source heart

```

```

Db      20  LGWYKPKLLCYCSNGGHFURLPDGKVGDTRRSDQHQLQLSADSDGEVVIKSTASQY  79
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY     146  VANYKPKLLCYCSNGGHFURLPDGTVGDTRRSDQHQLQLSADSDGEVVIKSTGTQY  205

Db      80  LAMDTNGLLYGSOLPGEECLFLERLEENHYNTYISKKHADKNWFYGLKKNKSLGPRTH  139

```

```

RESULT      10
ENTRY       A42410      #type complete
TITLE       ryudocan precursor - rat
ALTERNATE_NAMES  amphi glycan; heparan sulfate proteoglycan core protein
              ryudocan
ORGANISM    Rattus norvegicus #common_name Norway rat
DATE        04-Mar-1993  #sequence_revision 18-Nov-1994  #text_change
              20-Mar-1998
ACCESSIONS  A42410
REFERENCE   A42410
#authors    Kojima, T.; Shworak, N.W.; Rosenberg, R.D.
#journal     J. Biol. Chem. (1992) 267:4870-4877
#title       Molecular cloning and expression of two distinct
              CDNA-encoding heparan sulfate proteoglycan core proteins
              from a rat endothelial cell line.
#cross-references MVID:92165852
#accession  A42410
#status     preliminary
#molecule_type mRNA
#residues   1-202  #label KOJ
#cross-references GB:M81786; NID:G206822; PID:G206823
#experimental_source endothelial cell line
#note       sequence extracted from NCHI backbone (NCBI:84028).

```

QY	56	DPELSESGDLDDLEDSMIGPEVVHPLVDLNNHPRAGSGSQVTEPKKLENEVIPKR	115
Db	117	-APSDYGDMSKNVSMSSAQSGNIPIERTEV	146
QY	116	ISPVESEDVSNKVSMSSTVQSGNIPIERTEV	146
RESULT	12		
ENTRY		A4834	#type complete
TITLE			basic fibroblast growth factor - chicken
ORGANISM			#formal_name Gallus gallus #common_name chicken
DATE			01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change 16-Jul-1999
ACCESSIONS		A4834; S23636	
REFERENCE		A4834	
#authors		Borja, A.Z.; Meijers, C.; Zeller, R.	
#journal		Dev. Biol. (1993) 157:110-118	
#title		Expression of alternatively spliced bFGF first coding exons and antisense mRNAs during chicken embryogenesis.	
#cross-references		MUID:93246053	
#accession		A4834	
##status		preliminary	
##molecule_type		nucleic acid	
##residues		1-189 #label BOR	
##experimental_source		embryo	
##note		sequence extracted from NCBI backbone (NCBIN:131000, NCBI:131001)	
REFERENCE		S23636	
#authors		Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.	
#journal		Development (1990) 109:387-393	
#title		Fibroblast growth factor during mesoderm induction in the early chick embryo.	
#cross-references		MUID:90382254	
#accession		S23636	
##status		preliminary	
##molecule_type		DNA	
##residues		95-128 #label MIT	
##cross-references		EMBL:X56804; NID:962855; PIDN:CAA401:9.1; PID:962855	
CLASSIFICATION		#superfamily fibroblast growth factor	
SUMMARY		#length 189 #molecular-weight 20312 #checksum 8538	
Query Match		26.4%; Score 522; DB 2; Length 139;	
Best Local Similarity		54.5%; Pred. No. 1.66e-78;	
Matches		73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;	
Db	58	GHEKDKRYCKNGGFRLNPDGRVDGVRKSDPHIKILOAEEGVVSIKGVGSANREL	117
QY	147	ANYKKPALLYCSNGHFLRLPDGTVDGRSDQHIQLSAESVGVFIKSTETGQYL	206
Db	118	AKMEDGRLLAKCATECEFFERLESNNNTYRSRYSYD--NVVALKRTGQYKPGPKTGP	175
QY	207	AMDTDGLYGSQTPNEECFLERLEENHYNTISKHAEKNWFVGLKRNKSGCKRGPRTH	266
Db	176	GQKAILPLPSAKS	189
QY	267	GQKAILPLPVSS	280
RESULT	13		
ENTRY		S00185	#type complete
TITLE			basic fibroblast growth factor - sheep
ALTERNATE_NAMES		prostatropin	
ORGANISM			#formal_name Ovis orientalis aries, Ovis ammon aries
DATE			#common_name domestic sheep
			10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
ACCESSIONS		S00185	
REFERENCE		S00185	
#authors		Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice, E.C.; Rubira, M.R.; Burgess, A.W.	
#journal		FES Lett. (1987) 224:128-132	
#title		Primary structure of ovine pituitary basic fibroblast growth factor.	

REFERENCE
A61550


```
##molecule_type protein
##residues 27-35,'X',37-43 ##label BAI
##experimental_source kidney
REFERENCE A22054
#authors Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
#fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
##molecule_type protein
##residues 12-26 ##label BOH
COMMENT The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells).
#status This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen
FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
SUMMARY #length 157 #checksum 1115
Query Match 26.1%; Score 516; DB 1; Length 157;
Best Local Similarity 55.2%; Pred. No. 2.77e-77;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 26 GHFKDPKRLYCKNGGFLRHPDGRVDGVREKSDPHKIQLOAERGVSIGVCANRYL 85
::: || || || || || || || || || || || || || || || || || || || ||
147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTDRSDQHIQLQLSAESVGEVYIKSTETGQYL 206
|| || || || || || || || || || || || || || || || || || || || ||
86 AMKEDGRLLASCKVTECEFFERLESNNYTYRSRYS--SWYVALKRTGYKLGPKTGP 143
|| || || || || || || || || || || || || || || || || || || || ||
QY 207 AMDTDGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSCRGPRTHY 266
|||||||::: |
Db 144 GQKAILFLPMSAKS 157
|||||||::: |
QY 267 GQKAILFLPVS 280
|||||||::: |
RESULT 15
ENTRY A31674 #type complete
TITLE basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 21-May-1990 #sequence_revision 21-May-1990 #text_change
16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE A31674
#authors Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
Cooksey, K.; Baird, A.; Ling, N.
#journal Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of
its mRNA.
```

```
#cross-references MUID:89061721
#accession A31674
##molecule_type mRNA
##residues 1-154 ##label SHI
##cross-references GB:M22427; NID:g204285; PIDN:AAA41210.1; PID:g204286
REFERENCE S00876
#authors Kurokawa, T.; Seno, M.; Igarashi, K.
#journal Nucleic Acids Res. (1988) 16:5201
#title Nucleotide sequence of rat basic fibroblast growth factor
cDNA.
#cross-references MUID:88262516
#accession S00876
##molecule_type mRNA
##residues 1-154 ##label KUR
##cross-references EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204
REFERENCE S24309
#authors El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
#journal Biochim. Biophys. Acta (1992) 1131:314-316
#title PCR detection of the rat brain basic fibroblast growth factor
(bFGF) mRNA containing a unique 3' untranslated region.
#cross-references MUID:92329546
#accession S24309
##status preliminary; translation not shown
##molecule_type mRNA
##residues 35-154 ##label ELH
##cross-references EMBL:X61697; NID:g56143; PIDN:CAA43863.1; PID:g56144
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor
FEATURE
1-9 #domain signal sequence #status predicted #label SIG\
10-154 #product basic fibroblast growth factor #status
predicted #label MAT
SUMMARY #length 154 #molecular-weight 17139 #checksum 3026
Query Match 25.7%; Score 508; DB 2; Length 154;
Best Local Similarity 54.5%; Pred. No. 1.18e-75;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 23 GHFKDPKRLYCKNGGFLRHPDGRVDGVREKSDPHKIQLOAERGVSIGVCANRYL 82
::: || || || || || || || || || || || || || || || || || || || ||
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTDRSDQHIQLQLSAESVGEVYIKSTETGQYL 206
|| || || || || || || || || || || || || || || || || || || || ||
83 AMKEDGRLLASCKVTECEFFERLESNNYTYRSRYS--SWYVALKRTGYKLGSKTGP 140
|| || || || || || || || || || || || || || || || || || || || ||
QY 207 AMDTDGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNWFVGLKNGSCRGPRTHY 266
|||||||::: |
Db 141 GQKAILFLPMSAKS 154
|||||||::: |
QY 267 GQKAILFLPVS 280
|||||||::: |
Search completed: Tue Aug 29 16:05:56 2000
Job time : 79 secs.
```

MORPH (TM)

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 16:00:57 2000; MasPar time 10.20 Seconds
853.576 Million cell updates/sec
Molecular output not generated.

Title: >US-09-121-017B-23
Description: (1-281) from US09121017B.pep
Perfect Score: 1980
Sequence: 1 MAPARLFAALLFFVGGVAES.....PRTHYGKAILFLPLPVSSD 281

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: ~~sw4ss=prot38~~
1:swissprot

Statistics: Mean 47.651; Variance 81.808; scale 0.582

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	993	50.2	198	1	SDC4_HUMAN	SYNDECAN-4 PRECURSOR (9.50e-201
2	984	49.7	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 1.41e-198
3	967	48.8	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 1.77e-194
4	967	48.8	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 1.77e-194
5	953	48.1	152	1	FGF1_PTG	HEPARIN-BINDING GROWTH 4.17e-191
6	918	46.4	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 1.10e-182
7	917	46.3	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 1.90e-182
8	679	34.3	202	1	SDC4_RAT	SYNDECAN-4 PRECURSOR (1.00e-125
9	642	32.4	198	1	SDC4_MOUSE	SYNDECAN-4 PRECURSOR (5.16e-117
10	522	26.4	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 4.70e-89
11	516	26.1	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 1.14e-87
12	516	26.1	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 1.14e-87
13	508	25.7	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 7.91e-86
14	508	25.7	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 7.91e-86
15	509	25.7	153	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 4.66e-86
16	498	25.2	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 1.59e-83
17	489	24.7	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 1.83e-81
18	466	23.5	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 3.34e-76
19	374	18.9	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR 1.79e-55
20	351	17.7	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR 2.18e-50
21	351	17.7	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR 2.18e-50
22	350	17.7	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR 3.61e-50
23	329	16.6	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT 1.43e-45

24	324	16.4	207	1	FGFG_RAT	FIBROBLAST GROWTH FACT 1.75e-44
25	314	15.9	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA 2.57e-42
26	311	15.7	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA 1.15e-41
27	303	15.3	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA 6.05e-40
28	288	14.5	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT 9.78e-37
29	283	14.3	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT 1.13e-35
30	283	14.3	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 1.13e-35
31	283	14.3	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT 1.13e-35
32	279	14.1	194	1	FGF7_RAT	KERATINOCYTE GROWTH FA 7.95e-35
33	277	14.0	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT 2.11e-34
34	275	13.9	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT 5.57e-34
35	276	13.9	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT 3.43e-34
36	276	13.9	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT 3.43e-34
37	273	13.8	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT 1.47e-33
38	274	13.8	247	1	FGFE_MOUSE	FIBROBLAST GROWTH FACT 9.05e-34
39	273	13.8	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT 1.47e-33
40	271	13.7	256	1	FGF3_BRARE	FIBROBLAST GROWTH FACT 3.88e-33
41	269	13.6	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT 1.02e-32
42	265	13.4	197	1	SDC4_CHICK	SYNDECAN-4 PRECURSOR. 7.05e-31
43	263	13.3	225	1	FGFB_HUMAN	FIBROBLAST GROWTH FACT 1.85e-31
44	258	13.0	208	1	FGF6_HUMAN	FIBROBLAST GROWTH FACT 2.04e-30
45	257	13.0	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT 3.30e-30

ALIGNMENTS

RESULT 1
ID SDC4_HUMAN STANDARD; PRT; 198 AA.
AC P31431: Q16833: 000773;
DT 01-JUL-1993 (Rel. 26, Created)
DT 15-JUL-1998 (Rel. 36, Last sequence update)
DT 15-FEB-2000 (Rel. 39, Last annotation update)
DE SYNDECAN-4 PRECURSOR (AMPHIGLYCAN) (SYND4) (RYUDOCAN CORE PROTEIN).
GN SDC4.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=LUNG FIBROBLAST;
RX MEDLINE; 92363936.
RA David G., van der Schueren B., Marynen P., Cassiman J.-J.,
RT "Molecular cloning of amphiglycan, a novel integral membrane heparan
RT sulfate proteoglycan expressed by epithelial and fibroblastic
RT cells.";
RL J. Cell Biol. 118:961-969(1992).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 93176185.
RA Kojima T., Inazawa J., Takamatsu J., Rosenberg R.D., Saito H.;
RT "Human ryudocan core protein: molecular cloning and characterization
RT of the cDNA, and chromosomal localization of the gene.";
RL Biochem. Biophys. Res. Commun. 190:814-822(1993).
RN [3]
RP SEQUENCE FROM N.A.
RC TISSUE=PLACENTA;
RX MEDLINE; 96390006.
RA Takagi A., Kojima T., Tsuzuki S., Katsumi A., Yamazaki T., Sugitara I.,
RT Hamaguchi M., Saito H.;
RL "Structural organization and promoter activity of the human ryudocan
RL gene.";
RN J. Biochem. 119:979-984(1996).
RN [4]
RP SEQUENCE FROM N.A.
RX Bridgeman A.;
RL Submitted (APR-1999) to the EMBL/GenBank/DBJ databases.
CC -1- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEAR HEPARAN SULFATE.
CC -1- SUBCELLULAR LOCATION: TYPE I MEMBRANE PROTEIN.
CC -1- TISSUE SPECIFICITY: EXPRESSED IN EPITHELIAL AND FIBROBLASTIC
CC CELLS.
CC -1- SIMILARITY: BELONGS TO THE SYNDECAN FAMILY OF INTEGRAL MEMBRANE
CC PROTEOGLYCANS.

RT amino terminal sequences and specific mitogenic activities.";
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
 RN [13]
 RP SEQUENCE OF 16-49.
 RX MEDLINE: 86275260.
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;
 RT "Partial molecular characterization of endothelial cell mitogens from
 human brain: acidic and basic fibroblast growth factors.";
 RL FEBS Lett. 204:203-207(1986).
 RN [14]
 RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
 RX MEDLINE: 96194129.
 RA Blaber M., Disalvo J., Thomas K.A.;
 RT "X-ray crystal structure of human acidic fibroblast growth factor.";
 RL Biochemistry 35:2086-2094(1996).
 RN [15]
 RP STRUCTURE BY NMR OF 24-155.
 RX MEDLINE: 94358885.
 RA Gimenez-Gallego A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,
 RT "1H-NMR assignment and solution structure of human acidic fibroblast
 growth factor activated by inositol hexasulfate.";
 RL J. Mol. Biol. 242:81-98(1994).
 RN [16]
 RP STRUCTURE BY NMR OF 24-155.
 RX MEDLINE: 97107535.
 RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
 RT "Three-dimensional structure of acidic fibroblast growth factor in
 solution: effects of binding to a heparin functional analog.";
 RL J. Mol. Biol. 264:162-178(1996).
 RN [17]
 RP STRUCTURE BY NMR OF 25-155.
 RX MEDLINE: 98387896.
 RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
 RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
 6-naphthalenesulfonate: a minimal model for the anti-tumoral
 action of suramin and suradistas.";
 RL J. Mol. Biol. 281:899-915(1998).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES bFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 DR EMBL: M1361; AAA79245.1;
 DR EMBL: X51943; CAA36206.1;
 DR EMBL: M50492; AAA52446.1;
 DR EMBL: M30490; AAA52446.1; JOINED.
 DR EMBL: M30491; AAA52446.1; JOINED.
 DR EMBL: M60515; AAA51672.1;
 DR EMBL: M60516; AAA51673.1;
 DR EMBL: M23087; AAA52638.1;
 DR EMBL: M23086; AAA52638.1; JOINED.
 DR EMBL: S67291; AAB29057.1;
 DR EMBL: X65778; CAA46661.1;
 DR PIR: A23553; A23553.
 DR PIR: A24243; A24243.
 DR PIR: A24301; A24301.
 DR PIR: A24662; A24662.
 DR PIR: A24820; A24820.
 DR PIR: A26386; A26386.

DR PIR: A33665; A33665.
 DR PIR: S18217; S18217.
 DR PDB: 2AFG; 15-OCT-95.
 DR PDB: IAXM; 22-APR-98.
 DR PDB: 2AXM; 22-APR-98.
 DR PDB: ISML; 11-NOV-98.
 DR PDB: MIM; 131220; -.
 DR PFM; PF00167; FGF; 1.
 DR PRINTS: PR00262; ILIHGFG.
 DR PRINTS: PR00263; HGGFFGF.
 DR PROSITE: PS00247; HGGF_LFGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 KW 3D-structure.
 FT PROPEP 1 15
 FT CHAIN 16 155
 FT MOD_RES 2 2
 FT BINDING 24 28
 FT BINDING 113 116
 FT BINDING 113 116
 SQ SEQUENCE 155 AA; 17460 MW; F586E8BF09F1580 CRC64;
 Query Match 49.7%; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 1.41e-198;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
 Db 21 GNYKPKLYCSNGGHFLRLIPDGTGTRSDQRIQLQLSAESVGEVYIKSTGTQYL 80
 QY 147 ANYKPKLYCSNGGHFLRLIPDGTGTRSDQRIQLQLSAESVGEVYIKSTGTQYL 206
 Db 81 AMDTGLYGSQTPNECLFLERLEENHYNTYISKHAEKNFVGLKNGSKCRGPRTHY 140
 QY 207 AMDTGLYGSQTPNECLFLERLEENHYNTYISKHAEKNFVGLKNGSKCRGPRTHY 266
 Db 141 GOKAILFLPLPVSSD 155
 QY 267 GOKAILFLPLPVSSD 281
 RESULT 3
 ID FGFL MOUSE STANDARD; PRT; 155 AA.
 AC P10935;
 DT 01-JUL-1989 (Rel. 11, Created)
 DT 01-JUL-1989 (Rel. 11, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF).
 GN FGFL OR FGF-1 OR FGFA.
 OS Mus musculus (Mouse), and Rattus norvegicus (Rat).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC SPECIES=RAT;
 RA MEDLINE: 89240051.
 RX Goodrich S., Van G.C., Bahrenburg K., Mansson P.E.;
 RT "The nucleotide sequence of rat heparin binding growth factor 1
 RT (HBGF-1).";
 RL Nucleic Acids Res. 17:2867-2867(1989).
 RN [2]
 RP SEQUENCE FROM N.A.
 RC SPECIES=MOUSE;
 RA MEDLINE: 90201563.
 RX Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
 RT "Isolation of cDNAs encoding four mouse FGF family members and
 RT characterization of their expression patterns during embryogenesis.";
 RL Dev. Biol. 138:454-463(1990).
 RN [3]
 RP SEQUENCE FROM N.A.
 RC SPECIES=MOUSE;
 RA MEDLINE: 97128312.
 RX Madai F., Hackshaw K.V., Chiu I.M.;
 RT "Cloning and characterization of the mouse Fgf-1 gene.";
 RL Gene 179:231-236(1996).
 RN [4]

RT canine hearts.";
 RL Eur. J. Biochem. 181:67-73(1989).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC or send an email to license@isb-sib.ch).
 CC
 CC EMBL; X60317; CAA42869.1; -;
 CC PIR; S03954; S03954.
 CC HSP; P05230; 2AXM.
 CC PFAM; PF00167; FGF; 1.
 CC PROSITE; PS00247; HGF_FGF; 1.
 CC Growth factor; Mitogen; Vascularization; Heparin-binding.
 CC PROPEP 1 15
 CC CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.
 CC CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
 CC BINDING 24 28 HEPARIN (POTENTIAL).
 CC BINDING 113 116 HEPARIN (POTENTIAL).
 CC CONFLICT 31 31 C -> S (IN REF. 2).
 CC CONFLICT 39 39 R -> Y (IN REF. 2).
 CC NON_TER 152 152
 CC SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;
 SQ
 Query Match 48.1%; Score 953; DB 1; Length 152;
 Best Local Similarity 97.0%; Pred. No. 4.17e-191;
 Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
 Db 21 GNYKPKLYCSNGGHFLRLPDGTVGTRDSQHQIQLSAESVGEVYIKSTGTQYL 80
 QY 147 ANKKPKLYCSNGGHFLRLPDGTVGTRDSQHQIQLSAESVGEVYIKSTGTQYL 206
 Db 81 AMDTGLLYGSTPSECEFLERLEENHYNTYTSKKHAEKNFVGLKNGSKRGPRTHY 140
 QY 207 AMDTGLLYGSTPNECEFLERLEENHYNTYTSKKHAEKNFVGLKNGSKRGPRTHY 266
 141 GKAILFLPLPV 152
 267 GKAILFLPLPV 278
 RESULT 6
 ID FGF1_BOVIN STANDARD; PRT; 155 AA.
 AC P03968;
 DT 23-OCT-1986 (Rel. 02, Created)
 DT 01-MAR-1989 (Rel. 10, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR
 DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF
 DE II).
 GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
 OS Bos taurus (Bovine).
 OC Eukaryota; Metazoa; Chordata; Cranialata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
 OC Bovidae; Bovinae; Bos.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-RETINA;
 RX MEDLINE; 89083506.
 RA Halley C., Courtois Y., Laurent M.;
 RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.";
 CC

RL Nucleic Acids Res. 16:10913-10913(1988).
 RN [2]
 RP SEQUENCE FROM N.A.
 RC TISSUE-RETINA;
 RX MEDLINE; 89078619.
 RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
 RT "Characterization of a bovine acidic FGF cDNA clone and its
 RL expression in brain and retina.";
 RL FEBS Lett. 242:41-46(1988).
 RN [3]
 RP SEQUENCE OF 2-155.
 RX MEDLINE; 87016918.
 RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
 RT "Structural evidence that endothelial cell growth factor beta is the
 RT precursor of both endothelial cell growth factor alpha and acidic
 RT fibroblast growth factor.";
 RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
 RN [4]
 RP SEQUENCE OF 2-155.
 RX MEDLINE; 87026586.
 RA Crabb J.W., Ames L.G., Carr S.A., Johnson C.M., Roberts G.D.,
 RA Bordoli R.S., McKeenan W.L.;
 RT "Complete primary structure of prostatropin, a prostate epithelial
 RT cell growth factor.";
 RL Biochemistry 25:4988-4993(1986).
 RN [5]
 RP SEQUENCE OF 16-155.
 RX MEDLINE; 86070224.
 RA Gimenez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,
 RA Disalvo J., Thomas K.;
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid
 RT sequence and homologues.";
 RL Science 230:1385-1388(1985).
 RN [6]
 RP SEQUENCE OF 16-44, AND COMPOSITION.
 RX MEDLINE; 86055750.
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:
 RT amino-terminal sequence and comparison with basic FGF.";
 RL EMBO J. 4:1951-1956(1985).
 RN [7]
 RP SEQUENCE OF 16-56 FROM N.A.
 RX MEDLINE; 86261806.
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,
 RA Hjerild K.A., Gospodarowicz D., Fiddes J.C.;
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic
 RT protein, basic fibroblast growth factor.";
 RL Science 233:545-548(1986).
 RN [8]
 RP SEQUENCE OF 16-45.
 RX MEDLINE; 89231704.
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,
 RA Sharma H.S., Schaper W.;
 RT "Isolation of heparin-binding growth factors from bovine, porcine and
 RL canine hearts.";
 RL Eur. J. Biochem. 181:67-73(1989).
 RN [9]
 RP SEQUENCE OF 1-18 FROM N.A.
 RA Philippe J.M., Renaud F., Desset S., Laurent M.;
 RL Submitted (JUL-1992) to the EMBL/GenBank/DBJ databases.
 RN [10]
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
 RX MEDLINE; 91095983.
 RA Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RA Hsu B.T., Rees D.C.;
 RT "Three-dimensional structures of acidic and basic fibroblast growth
 RT factors.";
 RL Science 251:90-93(1991).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.

CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC EMBL; M13439; AAA30516.1; -
 CC EMBL; X13221; CAA31610.1; -
 CC EMBL; X14032; CAA32192.1; -
 CC EMBL; M35608; AAA30517.1; -
 CC EMBL; X66446; CAA47063.1; -
 CC EMBL; M97660; AAA30563.1; -
 CC EMBL; M97661; AAA30564.1; -
 CC PIR; A01385; GRBOA.
 CC PIR; A25043; A25043.
 CC PIR; B25043; B25043.
 CC PIR; C25043; C25043.
 CC PIR; A24477; A24477.
 CC PIR; B24663; B24663.
 CC PIR; S02102; S02102.
 CC PDB; 1BAR; 31-OCT-93.
 CC PDB; 1AFC; 31-OCT-93.
 CC PFAM; PF00167; FGF; 1.
 CC PRINTS; PR00262; IL1HBGF.
 CC PRINTS; PR00263; HBGF.FGF.
 CC PROSITE; PS00247; HBGF_FGF; 1.
 CC Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 CC 3D-structure.
 CC PROPEP 1 15
 CC CHAIN 2 155 ENDOTHELIAL CELL GROWTH FACTOR BETA.
 CC CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
 CC CHAIN 22 155 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
 CC MOD_RES 2 2 ACETYLATION.
 CC BINDING 24 28 HEPARIN (POTENTIAL).
 CC BINDING 113 116 HEPARIN (POTENTIAL).
 CC STRAND 27 31
 CC TURN 32 34
 CC STRAND 37 40
 CC TURN 42 43
 CC STRAND 46 49
 CC HELIX 55 57
 CC STRAND 59 61
 CC STRAND 69 69
 CC STRAND 71 73
 CC STRAND 79 82
 CC TURN 84 85
 CC TURN 87 91
 CC HELIX 96 98
 CC STRAND 100 100
 CC STRAND 103 104
 CC TURN 106 107
 CC STRAND 110 111
 CC STRAND 113 114
 CC TURN 116 121
 CC STRAND 123 123
 CC STRAND 126 126
 CC TURN 128 129
 CC STRAND 132 132
 CC STRAND 134 134
 CC HELIX 135 137
 CC TURN 140 141
 CC TURN 144 145
 CC STRAND 147 150
 CC SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;
 Query Match 46.4%; Score 918; DB 1; Length 155;
 Best Local Similarity 91.2%; Pred. No. 1.10e-182;

Matches 124; Conservative 7; Mismatches 5; Indels 0; Gaps 0;
 Db 20 LQNYKPKLLYCSNGYFLRILPDGTVDCTKDRSDQHQIQLCAESIGEVYIKSTETGQF 79
 :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
 QY 146 VANYKPKLLYCSNGHFLRILPDGTVDCTDRSDQHQIQLCAESVGEVYIKSTETGOY 205
 :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
 Db 80 LAMWTDGLYSGTNPNECLFLERLEENHYNYISKKHAKEHWFVGLKNGRSKLGPRTH 139
 :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
 QY 206 LAMWTDGLYSGTNPNECLFLERLEENHYNYISKKHAKEHWFVGLKNGRSKLGPRTH 265
 :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
 Db 140 FGOKAILFLPLPVSSD 155
 :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
 QY 266 YGOKAILFLPLPVSSD 281
 :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
 RESULT 7
 ID FGF1_CHICK STANDARD; PRT: 155 AA.
 AC P19596;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR).
 GN FGF1 OR FGF-1.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
 OC Gallus.
 CC [1]
 RN RP SEQUENCE FROM N.A.
 RX MEDLINE; 91347925.
 RA Schurch H., Risau W.;
 RT "Differentiating and mature neurons express the acidic fibroblast
 RT growth factor gene during chick neural development.";
 RL Development 111:1143-1154(1991).
 RN [2]
 RP SEQUENCE FROM N.A.
 RA Martin G.R., Han J.K.;
 RL Submitted (JUL-1995) to the EMBL/GenBank/DBJ databases.
 RN [3]
 RP SEQUENCE OF 22-48.
 RX MEDLINE; 88296438.
 RA Risau W., Gautschi-Sova P., Boehlen P.;
 RT "Endothelial cell growth factors in embryonic and adult chick brain
 RT are related to human acidic fibroblast growth factor.";
 RL EMBO J. 7:959-962(1988).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC -----
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 CC or send an email to license@isb-sib.ch).
 CC -----
 CC EMBL; S63263; AAB19629.1; -
 CC EMBL; U31863; AAA80310.1; -
 CC EMBL; S63261; AAD13942.1; -
 CC PIR; S02639; S02639.
 CC HSSP; P05230; 2AXM.
 CC PFAM; PF00167; FGF; 1.
 CC PRINTS; PR00262; IL1HBGF.
 CC PRINTS; PR00263; HBGF.FGF.
 CC PROSITE; PS00247; HBGF_FGF; 1.
 CC Growth factor; Mitogen; Vascularization; Heparin-binding.
 KW

FT	TRANSEM	150	174	POTENTIAL.	
FT	DOMAIN	175	202	CYTOPLASMIC (POTENTIAL).	
FT	CARBOHYD	44	44	O-LINKED (GLYCOSAMINOGLYCAN)	(POTENTIAL)
FT	CARBOHYD	65	65	O-LINKED (GLYCOSAMINOGLYCAN)	(POTENTIAL)
FT	CARBOHYD	67	67	O-LINKED (GLYCOSAMINOGLYCAN)	(POTENTIAL)
SQ	SEQUENCE	202 AA;	21962 MW;	5D9C8B3BF4C0D58A	CRG64;
Query Match 34.3%; Score 679; DB 1; Length 202;					
Best Local Similarity 73.5%; Pred. No. 1.00e-125;					
Matches 111; Conservative 14; Mismatches 20; Indels 6; Gaps					
Db	1	MAPVCLFAPLILLLLGGFPVARGSTRETEVDPQDLLEGRYFSGALPDEDDAGGLEQDS	60		
QY	1	MAPARLFA-LLLFFVGG--VA--ESIRETEVTDPODLLEGRYFSGALPDEDDVVGPGQS	55		
Db	61	D-PELSSGSDLLDTEEPRTFPEVISPLVPLDNHHPENAOGRIVRSEPKLEENEVIPKR	119		
QY	56	DFELSSGSDLLDLEDSMTGPEVWHPLVPLDNHHPERAGSGSQVTEPKKLEENEVIPKR	115		
Db	120	VPDVGDDDDVSNKVSMSSTSQGSNIFRTEV	150		
QY	116	ISPVESSEEDVSNKVSMSSTVQGSNIFRTEV	146		

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RESULT          9
ID              SDC4_MOUSE      STANDARD;      PRT;    198 AA.
AC              Q35988;
DT              15-FEB-2000 (Rel. 39, Created)
DT              15-FEB-2000 (Rel. 39, Last sequence update)
DT              15-FEB-2000 (Rel. 39, Last annotation update)
DE              SYNDECAN-4 PRECURSOR (RYUDOCAN CORE PROTEIN).
GN              SDC4.
OS              Mus musculus (Mouse).
OC              Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC              Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RN              SEQUENCE FROM N.A.
RC              STRAIN=C3H/AN, AND 129/SVJ;
RX              MEDLINE; 97420681.
RA              Tsuzuki S., Kojima T., Katsumi A., Yamazaki T., Suglura I., Saito H.;
RT              Molecular cloning, genomic organization, promoter activity, and
RT              tissue-specific expression of the mouse ryudocan gene.";
RL              J. Biochem. 122:17-24(1997).
CC              -1- FUNCTION: CELL SURFACE PROTOGLYCAN THAT BEAR HEPARAN SULFATE.
CC              -1- SUBCELLULAR LOCATION: TYPE I MEMBRANE PROTEIN.
CC              -1- TISSUE SPECIFICITY: UBIOUITOUS.
CC              -1- SIMILARITY: BELONGS TO THE SYNDECAN FAMILY OF INTEGRAL MEMBRANE
                  PROTEOGLYCANS.
-----
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CC              or send an email to license@isb-sib.ch).
-----
DR              EMBL; D89571; BAA22135.1; -
DR              EMBL; D89572; BAA22136.1; -
DR              MGD; MG1:1349164; SDC4.
DR              PFAM; PF01034; Syndecan; 1.
DR              PROSITE; PS00964; SYNDECAN; 1.
KW              Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein; Signal.
FT              SIGNAL
FT              CHAIN           1      23
FT              DOMAIN         24      198
FT              TRANSMEM       146     170
FT              DOMAIN         171     198
FT              CARBOHYD        44      44
FT              CARBOHYD        62      62
FT              CARBOHYD        64      64
SQ              SEQUENCE      198 AA; 21482 MW; 4246963EC6A25915 CRC64;

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QY	147	ANYKKPLLCSNGGHFLRILPDGTVDRDSQHQLQLSAESVGEVIKSTETGOYL	206
Db	87	AMKEDGRLALKATECECFERLESNNITYSRKYSD--WYVALKRTGYKPKPTGP	144
QY	207	AMDTDLGLYSQTNEECFLERLEENHYNTIISKHAEKNWFVLKKGSKRGPRTHY	266
Db	145	GQKAILEFLPMSAKS	158
QY	267	GQKAILEFLPVSS	280

RESULT 11

ID	FGF2-SHEEP	STANDARD;	PRT; 155 AA.
AC	P20003;		
DT	01-FEB-1991 (Rel. 17, Created)		
DT	01-FEB-1996 (Rel. 33, Last sequence update)		
DT	01-FEB-1996 (Rel. 33, Last annotation update)		
DE	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).		
DN	FGF2 OR FGF-2.		
GS	Eukaryotes (Sheep).		
OS	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;		
OC	Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;		
CC	Bovidae; Caprinae; Ovis.		
RN	[1]		
RP	SEQUENCE FROM N.A.		
RA	Sutton R., Ward W.G., Raphael K.A., Cam G.R.;		
RL	Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.		
RP	[2]		
RN	SEQUENCE OF 9-155.		
RX	MEDLINE; 88055577.		
RA	Samson R.J., Moritz R.L., Lloyd C.J., Fabri L.J.; Nice E.C.;		
RA	Rubira M.R., Burgess A.W.;		
RT	"Primary structure of ovine pituitary basic fibroblast growth factor."		
RL	FBS Lett. 224:128-132(1987).		
CC	-!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.		
CC	-!- SUBUNIT: MONOMER.		
CC	-!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFEG.		
CC	-!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.		
CC	-----		
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CC	-----		
CC	EMBL; L36136; AAA31519.1; .		
DR	PIR; S00185; S00185.		
DR	HSP; P09038; 1BF.		
DR	PFAM; PF00167; FGF; 1.		
DR	PRINTS; PR00262; ILIHGFG.		
DR	PRINTS; PR00263; HBGF.FGF.		
DR	PROSITE; PS00247; HBGF_FGF; 1.		
KW	Growth factor; Mitogen; Vascularization; Heparin-binding.		
FT	PROPEP 1 9		
FT	CHAIN 10 155		
FT	SITE 45 48		
FT	SITE 87 90		
FT	BINDING 27 31		
FT	BINDING 116 119		
FT	SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;		

Query Match	26.1%;	Score 516;	DB 1;	Length 155;
Best Local Similarity Matches	55.2%;	Pred. No. 1.14e-87;		
	74;	Conservative	22;	Mismatches 36;
			Indels	2;
			Gaps	1;

SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;
Query Match 26.18; Score 516; DB 1; Length 155;
Best Local Similarity 55.28; Pred. No. 1.14e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 24 GHFKDPKRLKCKNGGFLRIHPDGRVGVREKSDPHIKLQLOAEERGVVSIKGVCANRYL 83
QY 147 ANYKKPKLLKCYSGNGGFLRLPDGTVDGTRDSQHQIQLQLSAESVGEVYIKSTETGQYL 206
Db 84 AMKEDGRLLASKVDCFFERLESNNYTYRSKYS--SWTVALKRTQYKLGPKTGP 141
QY 207 AMDTDGLLYGSGTQPNCECLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 266
Db 142 GOKAILFLPMSAKS 155
QY 267 GOKAILFLPLPVSS 280
RESULT 13
FCF2 RAT STANDARD; PRT; 154 AA.
P3109; 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=OVARY;
RX MEDLINE; 89061721.
RA Shimaseki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RT "Complementary DNA cloning and sequencing of rat ovarian basic
RT fibroblast growth factor and tissue distribution study of its mRNA.";
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RC TISSUE=BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA";
RL Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
RT "Cloning of the rat fibroblast growth factor-2 promoter region and
RT its response to mitogenic stimuli in glioma C6 cells";
RL J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
RT "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
RT mRNA containing a unique 3' untranslated region";
RL Blochm. Biophys. Acta 1131:314-316(1992).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876.
CC PIR; A31674; A31674.
CC HSSP; P09038; 1BFF.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; ILIHGF.
CC PRINTS; PR00263; HBGF.FGF.
CC PROSITE; PS00247; HBGF.FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;
Query Match 25.78; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 7.91e-86;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 23 GHFKDPKRLKCKNGGFLRIHPDGRVGVREKSDPHIKLQLOAEERGVVSIKGVCANRYL 82
QY 147 ANYKKPKLLKCYSGNGGFLRLPDGTVDGTRDSQHQIQLQLSAESVGEVYIKSTETGQYL 206
Db 83 AMKEDGRLLASKVDCFFERLESNNYTYRSKYS--SWTVALKRTQYKLGSKTGP 140
QY 207 AMDTDGLLYGSGTQPNCECLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 266
Db 141 GOKAILFLPMSAKS 154
QY 267 GOKAILFLPLPVSS 280
RESULT 14
ID FGF2 MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basilio C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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Science 251:90-93(1991).
[14]
RN STRUCTURE BY NMR.
RX MEDLINE: 97040521.
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.:
RT "High-resolution solution structure of basic fibroblast growth factor
RT determined by multidimensional heteronuclear magnetic resonance
RT spectroscopy".
RL Biochemistry 35:13552-13561(1996).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC
CC EMBL: M17599; AAA52534.1; ALT_INIT.
CC EMBL: X04431; CAA28027.1; -
CC EMBL: X04432; CAA28028.1; -
CC EMBL: X04433; CAA28029.1; -
CC EMBL: M27968; AAA52448.1; -
CC EMBL: J04513; AAA52533.1; ALT_INIT.
CC PIR: A25824; A25824.
CC PIR: A26642; A26642.
CC PIR: B24243; B24243.
CC PIR: B24301; B24301.
CC PIR: B32878; B32878.
CC PIR: S00297; S00297.
CC PDB: 2FGF; 15-APR-92.
CC PDB: 4FGF; 15-JUL-93.
CC PDB: 1FGA; 15-JUL-93.
CC PDB: 1BFB; 03-APR-96.
CC PDB: 1BFC; 03-APR-96.
CC PDB: 1BFF; 16-JUN-97.
CC PDB: 1BFG; 31-JAN-94.
CC PDB: 2BFB; 30-APR-94.
CC PDB: 1BLA; 08-NOV-96.
CC PDB: 1BLD; 08-NOV-96.
CC MIM: 134920; -
CC PFAM: PF00167; FGF; 1.
CC PRINTS: PR00262; IL1HBGF.
CC PRINTS: PR00263; HBGFPGF.
CC PROSITE: PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding;
KW 3D-structure.
FT PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
FT STRAND 30 34 HEPARIN (POTENTIAL).
FT TURN 35 38
FT STRAND 39 43
FT TURN 45 46
FT STRAND 49 52
FT TURN 55 56
FT HELIX 58 60
FT STRAND 62 66
FT TURN 69 70
FT STRAND 71 76
FT TURN 80 80
FT STRAND 81 85

FT TURN 87 88
FT STRAND 91 94
FT HELIX 99 101
FT STRAND 103 107
FT TURN 109 110
FT STRAND 113 117
FT TURN 121 122
FT STRAND 124 124
FT STRAND 127 127
FT TURN 129 130
FT STRAND 132 133
FT HELIX 136 138
FT TURN 141 142
FT HELIX 144 146
FT STRAND 148 152
SQ SEQUENCE 155 AA; 17254 MW; B6CE13373007129 CRC64;

Query Match 25.7%; Score 509; DB 1; Length 155;
Best Local Similarity 54.5%; Pred. No. 4.66e-86;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 24 GHFKDPKLYCKNGGFFLRHPDGRVDGVREKSDPHILQLQAEERGVSIVKVCANRYL 83
QY 147 ANYKKPLKLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLLSAESVGEYIYKSTETGQYL 206

Db 84 AMKEDGRLLAKCVTDECFERLESNNYNTYRSRY--SWYVALKRTGYKLGSKTGP 141
QY 207 AMDTGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNWFVLKKNKSGCKRGPRIHY 266

Db 142 GKAILFLPMSAKS 155
QY 267 GKAILFLPLPVSS 280

Search completed: Tue Aug 29 16:01:25 2000
Job time : 28 secs.

M P E R C H
***** (TM)

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 16:01:42 2000; MasPar time 23.63 Seconds
824.524 Million cell updates/sec
Tabular output not generated.

Title: ~~US-09-121-017B-23~~
Description: (1-281) from US09121017B.pep
Perfect Score: 1980
Sequence: 1 MAPARLALLFFVGGVAES.....PRTHYGKAILFLPLPVSSD 281

Scoring table: PAM 150
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: sptrcm112
1:sp_archaea 2:sp_bacteria 3:sp_fungi 4:sp_human
5:sp_invertebrate 6:sp_mammal 7:sp_mhc 8:sp_organelle
9:sp_phase 10:sp_plant 11:sp_rodent 12:sp_unclassified
13:sp_vertebrate 14:sp_virus

Statistics: Mean 46.003; Variance 77.721; scale 0.592

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				
Result No.	Score	Query Match	Length DB ID	Description Pred. No.
1	642	32.4	198 11	O35988 RYUDOCAN CORE PROTEIN 1.22e-119
2	511	25.8	130 6	O77767 BASIC FIBROBLAST GROWTH 1.43e-88
3	509	25.7	196 4	P78443 21 KD BASIC FIBROBLAST 4.36e-88
4	382	19.3	101 13	P79706 BASIC EGF (FRAGMENT) 1.07e-58
5	346	17.5	146 13	O07659 FIBROBLAST GROWTH FACT 1.45e-50
6	313	15.8	115 11	O60487 BASIC FIBROBLAST GROWTH 3.24e-43
7	313	15.8	194 6	P79150 KERATINOCYTE GROWTH FA 3.24e-43
8	289	14.6	212 13	O42407 FIBROBLAST GROWTH FACT 5.98e-38
9	274	13.8	252 11	O89096 FGF-4b 1.07e-34
10	265	13.4	60 4	O16588 ACIDIC FIBROBLAST GROW 9.24e-33
11	265	13.4	70 11	O54837 FIBROBLAST GROWTH FACT 9.24e-33
12	264	13.3	59 4	O16089 ACIDIC FIBROBLAST GROW 1.51e-32
13	260	13.1	196 13	O9YH31 PUTATIVE FIBROBLAST GR 1.09e-31
14	257	13.0	243 13	O9W6A1 FIBROBLAST GROWTH FACT 4.74e-31
15	251	12.7	127 4	O99517 FIBROBLAST GROWTH FACT 8.94e-30
16	250	12.6	206 13	O9YGD8 FIBROBLAST GROWTH FACT 1.46e-29
17	248	12.5	192 4	O95303 FIBROBLAST GROWTH FACT 3.86e-29
18	248	12.5	245 13	O9W6A2 FIBROBLAST GROWTH FACT 3.86e-29
19	236	11.9	200 13	P79925 FIBROBLAST GROWTH FACT 1.29e-26
20	225	11.4	74 6	O77561 KERATINOCYTE GROWTH FA 2.51e-24

21	226	11.4	425	5	O76831	LET-756 PROTEIN.	1.56e-24
22	223	11.3	204	13	O90696	FIBROBLAST GROWTH FACT	6.50e-24
23	222	11.2	210	13	O57341	FIBROBLAST GROWTH FACT	1.05e-23
24	217	11.0	770	5	P91672	EGF HOMOLOG.	1.12e-22
25	213	10.8	244	4	O14915	FIBROBLAST GROWTH FACT	7.35e-22
26	209	10.6	210	13	O42278	FIBROBLAST GROWTH FACT	4.79e-21
27	207	10.5	129	4	O60371	R33683.2	1.22e-20
28	199	10.1	285	14	O9YMH2	FIBROBLAST GROWTH FACT	4.99e-19
29	198	10.0	182	14	O92401	FGF-ACMNPV ORF32.	7.92e-19
30	187	9.4	216	4	O95750	FGF-19.	7.21e-16
31	183	9.2	73	6	O97573	FIBROBLAST GROWTH FACT	7.36e-16
32	181	9.1	114	4	O16443	BASIC FIBROBLAST GROW	1.81e-15
33	181	9.1	114	4	O00527	BASIC FIBROBLAST GROW	1.81e-15
34	157	7.9	78	11	O35340	FIBROBLAST GROWTH FACT	6.73e-11
35	120	6.1	384	2	O07819	CYTOCHROME.	2.14e-04
36	116	5.9	82	6	O62682	FIBROBLAST GROWTH FACT	9.58e-04
37	112	5.7	86	13	P79685	FIBROBLAST GROWTH FACT	4.18e-03
38	108	5.5	375	11	O88701	NUCLEOSOME ASSEMBLY PR	1.75e-02
39	106	5.4	507	2	O92EP3	SENSORY HISTIDINE KINA	3.54e-02
40	106	5.4	2607	5	O23187	W06A7.3A PROTEIN.	3.54e-02
41	105	5.3	193	5	O76215	DENSE GRANULE PROTEIN.	5.02e-02
42	102	5.2	239	2	O69564	PUTATIVE LIPOPROTEIN.	1.41e-01
43	102	5.2	243	14	O73554	HYPOTHETICAL 27.5 KD P	1.41e-01
44	103	5.2	837	5	O25751	A332 ANTIGEN (FRAGMENT	1.00e-01
45	101	5.1	822	1	O27154	CONSERVED PROTEIN.	1.99e-01

ALIGNMENTS

RESULT 1		PRELIMINARY:		PRT:		198 AA.	
ID	O35988	AC	O35988:	DT	01-JAN-1998	(TRENBLrel. 05, Created)	
DT	01-JAN-1998	(TRENBLrel. 05, Last sequence update)		DT	01-NOV-1998	(TRENBLrel. 12, Last annotation update)	
DT	01-NOV-1998	(TRENBLrel. 12, Last annotation update)		DE	RYUDOCAN CORE PROTEIN PRECURSOR.		
DE	RYUDOCAN CORE PROTEIN PRECURSOR.			OS	Mus musculus (Mouse).		
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;			OC	Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.		
RN	[1]			RP	SEQUENCE FROM N.A.		
RP	SEQUENCE FROM N.A.			RC	STRAIN-C3H/AN, AND 129SVJ;		
RX	MEDLINE: 97420681.			RA	TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;		
RT	"Molecular cloning, genomic organization, promoter activity, and			RT	tissue-specific expression of the mouse ryudocan gene.";		
RL	J. Biochem. 122:17-24(1997).			CC	FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN		
CC	SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO			CC	THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.		
DR	EMBL; D89571; BAA22135.1; -;			DR	EMBL; D89572; BAA22136.1; -;		
DR	PROSITE; PS00964; SYNDSCAN; 1.			DR	PFAM; PF01034; Syndcan; 1.		
KW	Signal; Proteoglycan; Heparan sulfate; Transmembrane; GJ-coprotein.			FT	SIGNAL	1 23	POTENTIAL.
FT	CHAIN	1 24	198	POTENTIAL.			
SQ	SEQUENCE	198 AA;	21482 MW;	FC67B0E5	CRC32;		
Query Match 32.4%; Score 642; DB 11; Length 198;							
Best Local Similarity 73.5%; Pred. No. 1.22e-119;							
Matches 11; Conservative 16; Mismatches 14; Indels 10; Gaps 7;							
Db	1	MAPACLLAPLLLLLGGFPVPGESIRETEVIDPDLLEGRYFSGALPDDEA-G-G--S	56				
Qy	1	MAPARLFA-LLFFVGG---VA-ESIRETEVIDPDLLEGRYFSGALPDDEVDVPGQES	55				
Db	57	DDFELSGGDLDDTEPRFPFVIEPLVDNHPENAPQGIKVPSEKLENEVIPKR	116				
Qy	56	DDFELSGGDLDDLSGDMIGPEVHPVPLVDNHPERAGSGSQVTEPKKLENEVIPKR	115				
Db	117	-APSDVGDDNSKNKVSMSSTAGCSNIFRTEV	146				

KT	oi the chick limb bud through interaction with FG8, an apical
RT	ectodermal factor.";
RL	Development 124; 2235-2244(1997).
DR	EMBL; D86333; BAA24945.1; "-
DR	HSSP; P03968; 1BAR.
DR	PRAM; PF00167; FGF; 1.
DR	PRINTS; PR00263; HBGEFGF.
SQ	SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;
	Query Match 14.6%; Score 289; DB 13; Length 212;
	Best Local Similarity 39.1%; Pred. No. 5.98e-38;
	Matches 52; Conservative 26; Mismatches 51; Indels 4; Gaps 4;
Dd	82 RKRL-Y-SYNYKFLAKIENKGVSCTKNCDFSLDITSVGIWVAVKSISNTYLANN 139

DR PFAM; PF00167; FGF; 1.
FT NON_TER 59
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 13.3%; Score 264; DB 4; Length 59;
Best Local Similarity 97.2%; Pred. No. 1.51e-32;
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 56
QY 147 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 182

RESULT 13

ID Q9YH31 PRELIMINARY; PRT; 196 AA.

AC Q9YH31;

DT 01-MAY-1999 (TReMBLrel. 10, Created)

DT 01-MAY-1999 (TReMBLrel. 10, Last sequence update)

DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)

PUTATIVE FIBROBLAST GROWTH FACTOR-4.

Notophthalmus viridescens (Eastern newt) (Triturus viridescens).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;

OC Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.

RN [1]

RP SEQUENCE FROM N.A.

RA WEI Y.;

RT "Putative Newt Fibroblast Growth Factor-4."

RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.

DR EMBL; 076998; AAC98812.1; -

DR HSP; P09038; IBFF.

DR PROSITE; PS00247; HBGF_FGF; 1.

SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 13.1%; Score 260; DB 13; Length 196;

Best Local Similarity 34.6%; Pred. No. 1.09e-31;

Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;

Db 71 KRRLRYCNGVGFHQLVLPDGRIGRMSES--RYSLSISPVRGVCMFGVQSGGLFLAM 129

QY 150 KPKLLYCSNGGHF-LRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETQOYLAM 208

Db 130 NSKGLFGSKYFSDCKFKEMLLPNYNAYESWRYPGM--YIALSKNGRAKKGVSPMT 187

QY 209 DTDLGLYSGTQNEECFLERLEENHYNTIYISKHAEKNWFVGLKNGCKRGPRTHYGO 268

Db 188 TVTHFLP 194

269 KAILFLP 275

RESULT 14

ID Q9W6A1 PRELIMINARY; PRT; 243 AA.

AC Q9W6A1;

DT 01-NOV-1999 (TReMBLrel. 12, Created)

DT 01-NOV-1999 (TReMBLrel. 12, Last sequence update)

DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)

DE FIBROBLAST GROWTH FACTOR 12 ISOFORM A.

GN FGF12.

OS Gallus gallus (Chicken).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;

OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.

RN [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 99065510.

RA MUNOZ-SANJUAN I., SIMANDL B.K., FALLON J.F., NATHANS J.;

RT "Expression of chicken fibroblast growth factor homologous factor

(FHF)-1 and of differentially spliced isoforms of FHF-2 during

development and involvement of FHF-2 in chicken limb development."

RL Development 126:409-421(1999).

DR EMBL; AF108754; AAD21575.1; -

DR PROSITE; PS00247; HBGF_FGF; 1.

SQ SEQUENCE 243 AA; 27455 MW; A9E6E8CD CRC32;

Query Match 13.0%; Score 257; DB 13; Length 243;
Best Local Similarity 34.4%; Pred. No. 4.74e-31;
Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps 3;

Db 77 LF-SQOQYFIQMHDPDGTIDGTKDENSQYTFLENLPVGLRVVAIOGVKAGLVAMNGEYL 135
QY 155 LYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETQOYLAMDTDGLL 214

Db 136 YSSDVFTEPECKFESVFENYVYSSLYRQESGRAFLGNKEGOIMKGNVKKTKPS 195
QY 215 YGSQTPNEECFLERLEENHYNTISK--KHAE--KNWFVGLKNGCKRGPRTHYGO 270

Db 196 SHFVPKPI 203

QY 271 ILFLPLPV 278

RESULT 15

ID Q99517 PRELIMINARY; PRT; 127 AA.

AC Q99517;

DT 01-MAY-1997 (TReMBLrel. 03, Created)

DT 01-MAY-1997 (TReMBLrel. 03, Last sequence update)

DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)

DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).

GN FGF12.

OS Homo sapiens (Human).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

OC Eutheria; Primates; Catarrhini; Hominidae; Homo.

RN [1]

RP SEQUENCE FROM N.A.

RA COULIER F., PONTAROTTI P., ROUBIN R., HARTUNG H., GOLDFARB M.,

RA BIRNBAUM D.;

EL J. Mol. Evol. 0:0-0(0).

DR EMBL; Z70276; CA94240.1; -

DR HSP; P03968; IAF.

DR PROSITE; PS00247; HBGF_FGF; 1.

DR PFAM; PF00167; FGF; 1.

FT NON_TER 1 127

SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 12.7%; Score 251; DB 4; Length 127;

Best Local Similarity 34.6%; Pred. No. 8.94e-30;

Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps 3;

Db 2 LF-SQOQYFIQMHDPDGTIDGTKDENSQYTFLENLPVGLRVVAIOGVKAGLVAMNGEYL 60

QY 155 LYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETQOYLAMDTDGLL 214

Db 61 YSSDVFTEPECKFESVFENYVYSSLYRQESGRAFLGNKEGOIMKGNVKKTKPS 120

QY 215 YGSQTPNEECFLERLEENHYNTISK--KHAE--KNWFVGLKNGCKRGPRTHYGO 270

Db 121 SHFVPKP 127

QY 271 ILFLPLP 277

Search completed: Tue Aug 29 16:04:20 2000
Job time : 158 secs.

MORPH

(TM)

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm

On: Tue Aug 29 16:09:47 2000; MasPar time 6.86 Seconds
593.829 Million cell updates/sec

Molecular output not generated.

Title: >US-09-121-017B-25
(1-172) from US09121017B.pep
Perfect Score: 1242
Sequence: 1 MSGAGRVQGTQLQALVFLGV.....PRTHYGKAILFLPLPVSSD 172

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0\$
Listing first 45 summaries

Database: a-geneseq36
1:geneseq36

Statistics: Mean 31.369; Variance 128.700; scale 0.244

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				
Result No.	Score	Query Match	Description	Pred. No.
1	985	79.3	Human acidic fibroblasts	2.79e-87
2	985	79.3	Human acidic fibroblasts	2.79e-87
3	985	79.3	Human acidic fibroblast	2.79e-87
4	985	79.3	Human recombinant aFGF	2.79e-87
5	985	79.3	Human acidic fibroblasts	2.79e-87
6	985	79.3	Sequence of human prot	2.79e-87
7	985	79.3	Human acidic fibroblasts	2.79e-87
8	985	79.3	Human aFGF encoded by	2.79e-87
9	985	79.3	Human beta-endothelial	2.79e-87
10	985	79.3	Human beta-endothelial	2.79e-87
11	985	79.3	Human endothelial cell	2.79e-87
12	985	79.3	Human beta-endothelial	2.79e-87
13	985	79.3	Human acidic fibroblasts	2.79e-87
14	985	79.3	FGF-1.	2.79e-87
15	985	79.3	Sequence encoded by co	2.79e-87
16	985	79.3	Fibroblast growth fact	2.79e-87
17	985	79.3	Fibroblast growth fact	2.79e-87
18	985	79.3	Fibroblast growth fact	2.79e-87
19	985	79.3	Human endothelial cell	2.79e-87
20	985	79.3	Human endothelial cell	2.79e-87
21	985	79.3	Human BECGF encoded by	2.79e-87
22	985	79.3	Human endothelial cell	2.79e-87
23	983	79.1	Human alpha-endothelia	4.48e-87

24	983	79.1	134	1	W92282	Human alpha-endothelia	4.48e-87
25	983	79.1	134	1	W04807	Human alpha-endothelia	4.48e-87
26	974	78.4	156	1	W1383	Fibroblast growth fact	3.78e-86
27	972	78.3	135	1	W06817	Human endothelial cell	6.07e-86
28	960	77.3	132	1	R1327	9 N-terminal residue d	1.04e-84
29	960	77.3	132	1	R25418	aFGF mutein #2.	1.04e-84
30	954	76.8	155	1	R25570	Recombinant human Ala1	4.32e-84
31	954	76.8	155	1	W00561	Human (Gly93) aFGF ana	4.32e-84
32	949	76.4	140	1	R65935	Fibroblast growth fact	1.41e-83
33	938	75.5	129	1	R25413	aFGF mutein #3.	1.91e-82
34	938	75.5	129	1	R1328	12 N-terminal residue	1.91e-82
35	922	74.2	154	1	R05315	Human acidic fibroblasts	8.40e-81
36	917	73.8	140	1	R90069	Bovine acidic fibrobla	2.74e-80
37	917	73.8	140	1	R74648	Bovine recombinant aFG	2.74e-80
38	917	73.8	140	1	R13030	Brain-derived acidic f	2.74e-80
39	917	73.8	140	1	R65934	Bovine fibroblast grow	2.74e-80
40	917	73.8	140	1	R34496	Bovine acidic fibrobla	2.74e-80
41	917	73.8	140	1	R25915	Human acidic fibroblas	2.74e-80
42	916	73.8	154	1	R90074	Recombinant bovine muta	3.47e-80
43	906	72.3	141	1	R25569	Recombinant human Ala	3.70e-79
44	906	72.9	141	1	W00560	Bovine (Ala47/Gly93) a	3.70e-79
45	900	72.5	136	1	W01747	Chimeric acid/basic fi	1.53e-78

ALIGNMENTS

RESULT 1
ID R25914 standard; peptide; 140 AA.
AC R25914;
DT 26-JAN-1993 (first entry)
DE Human acidic fibroblast growth factor.
KW viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;
KW herpes varicella; herpes zoster; cytomegalovirus; influenza;
KW human respiratory syncytial virus; Semliki Forest virus; HIV;
KW human immunodeficiency virus; Moloney Sarcoma virus.
OS Homo sapiens.
PN EP-497341-A.
PD 05-AUG-1992.
PE 30-JAN-1992; 101541.
PR 31-JAN-1991; GB-002145.
PR 09-JAN-1992; GB-000410.
PA (FARM) FARMITALIA ERBA SRL CARLO.
PI Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;
DR WPI; 92-260792/32.
PT Synergistic antiviral composition contains BFGF and sulphated
PT polysaccharide - for treating viral infections e.g. HSV-1 and -2,
PT cytomegalovirus, HIV, influenza virus etc.
PS Disclosure; Page 4; 20pp; English.
CC This sequence represents acidic fibroblast growth factor (aFGF).
CC aFGF, or its fragments may be used in a synergistic compsn. with an
CC antivirally active sulphated polysaccharide, and one or more
CC excipients. The compsn. may be used to control herpes simplex virus
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;
CC human respiratory syncytial virus; Semliki Forest virus; HIV or
CC Moloney Sarcoma virus. The combination of aFGF with sulphated
CC polysaccharide is found to have a greater antiviral activity than
CC expected for an additive effect. See also R25913-5.
SQ Sequence 140 AA;
Query Match 79.3%; Score 985; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 2.79e-87;
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 5 PONYKKPKLLYCSNGGHPFLRLPDGTVDTGRDSDQHIQLQLSAESVGEVIKSTETGQY 64
:::|||||
Qy 37 SANYKKPKLLYCSNGGHPFLRLPDGTVDTGRDSDQHIQLQLSAESVGEVIKSTETGQY 96
:::|||||
Db 65 LAMDTDGLLYGSQTPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSCRGPRTH 124
|||||
Qy 97 LAMDTDGLLYGSQTPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSCRGPRTH 156
|||||
Db 125 YGQKAILFLPLPVSSD 140
|||||

QY 157 YGOKAILFLPLPVSSD 172

RESULT 2

ID R34497;
AC R34497;
DT 06-AUG-1993 (first entry)
DE Human acidic Fibroblast Growth Factor.
KW aFGF; muten; glycosylation site; glycoprotein.
OS Homo sapiens.
PN J05076336-A.
PD 30-MAR-1993.
PF 30-MAY-1991; 127435.
PR 31-MAY-1990; JP-143388.
PA (TAKE) TAKEDA CHEM IND LTD.
DR WPI; 93-139564/17.
PT FGF muten prep. useful for therapy of burn or thrombosis - by
PT transformation of lymphocyte-contained animal cell by vector
PT contg. DNA encoding FGF muten
PT Disclosure; Page 3; 23pp; Japanese.
CC The invention covers mutants of FGF (esp. bFGF) which contain at
CC least one glycosylation site. The muten can be used to treat burns
CC and thrombosis.
SQ Sequence 140 AA;

Query Match 79.3%; Score 985; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 2.79e-87;
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 5 PGNKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 64

QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 96

Db 65 LAMDTDGLLYGSOTPNECLFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSOTPNECLFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

Db 125 YGOKAILFLPLPVSSD 140

QY 157 YGOKAILFLPLPVSSD 172

RESULT 3

ID P90068 standard; protein; 140 AA.
AC P90068;
DT 1-NOV-1989 (first entry)
DE Human acidic fibroblast growth factor
DE Human acidic fibroblast growth factor; mutant.
OS Homo sapiens
PN EP-319052-A.
PD 14-JUN-1989.
PF 14-OCT-1988; 202306.
PR 22-OCT-1987; EP-244431.
PA (MERI) Merck and Co.
PI Thomas Jnr KA, Linemeyer DL;
DR WPI; 89-167092/23.
PT Mutant acidic fibroblast growth factor
PT - used for promoting repair of soft tissue, musculoskeletal
PT tissue or vascular or nerve tissue and plasminogen
PT activator prodn.
PS Disclosure; page 4; 36pp; English.
CC Amino acid sequence of human acidic fibroblast growth
CC factor (aFGF). The patent claims mutant forms which have
CC increased biological activity with(out) heparin, and promote
CC cell growth.
SQ Sequence 140 AA;

Query Match 79.3%; Score 985; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 2.79e-87;
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db PGNKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 64

QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 96

QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 96

Db 65 LAMDTDGLLYGSOTPNECLFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSOTPNECLFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

Db 125 YGOKAILFLPLPVSSD 140

QY 157 YGOKAILFLPLPVSSD 172

RESULT 4

ID R74547 standard; protein; 140 AA.
AC R74547;
DT 25-SEP-1995 (first entry)
DE Human recombinant aFGF.
KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis;
KW mitogen.
OS Homo sapiens.
PN US5401832-A.
PD 28-MAR-1995.
PF 24-DEC-1984; 685923.
PR 24-DEC-1984; US-685923.
PR 12-SEP-1985; US-774359.
PR 30-MAY-1986; US-868473.
PR 11-JUL-1985; US-884460.
PR 04-JUN-1987; US-054991.
PR 04-MAY-1988; US-190293.
PR 08-FEB-1991; US-654397.
PR 25-SEP-1991; US-765472.
PR 25-SEP-1992; US-951365.
PA (MERI) MERCK & CO INC.
PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;
PI WPI; 95-139983/18.

DR New recombinant human acidic fibroblast growth factor - used to
PT promote cell growth, to promote wound healing, for vascular
PT grafts and blood vessel repair
PS Claim 2; Column 30; 25pp; English.
CC Oligonucleotides were synthesized on the basis of the amino acid
CC sequence of bovine acidic fibroblast growth factor (aFGF) and
CC used to produce a synthetic gene (given in Q88233) incorporating
CC codons preferred by E. coli or mammalian cells, unique cloning
CC sites, etc. This synthetic gene was mutagenized to obtain a gene
CC encoding a human recombinant aFGF (R74647) having activity
CC equivalent to the native protein.
SQ Sequence 140 AA;

Query Match 79.3%; Score 985; DB 1; Length 140;
Best Local Similarity 98.5%; Pred. No. 2.79e-87;
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 5 PGNKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 64

QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQY 96

Db 65 LAMDTDGLLYGSOTPNECLFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSOTPNECLFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

Db 125 YGOKAILFLPLPVSSD 140

QY 157 YGOKAILFLPLPVSSD 172

RESULT 5

ID W04806 standard; protein; 140 AA.
AC W04806;
DT 29-DEC-1996 (first entry)
DE Human acidic fibroblast growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW Heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor; ss.
OS Homo sapiens.

DB	Accession	Similarity	Score	DB 1	Length	DB 2	Score	DB 3	Length	DB 4	Score	DB 5	Length	DB 6	Score	DB 7	Length	DB 8	Score	DB 9	Length	DB 10	Score	DB 11	Length	DB 12	Score	DB 13	Length	DB 14	Score	DB 15	Length	DB 16	Score	DB 17	Length	DB 18	Score	DB 19	Length	DB 20	Score	DB 21	Length	DB 22	Score	DB 23	Length	DB 24	Score	DB 25	Length	DB 26	Score	DB 27	Length	DB 28	Score	DB 29	Length	DB 30	Score	DB 31	Length	DB 32	Score	DB 33	Length	DB 34	Score	DB 35	Length	DB 36	Score	DB 37	Length	DB 38	Score	DB 39	Length	DB 40	Score	DB 41	Length	DB 42	Score	DB 43	Length	DB 44	Score	DB 45	Length	DB 46	Score	DB 47	Length	DB 48	Score	DB 49	Length	DB 50	Score	DB 51	Length	DB 52	Score	DB 53	Length	DB 54	Score	DB 55	Length	DB 56	Score	DB 57	Length	DB 58	Score	DB 59	Length	DB 60	Score	DB 61	Length	DB 62	Score	DB 63	Length	DB 64	Score	DB 65	Length	DB 66	Score	DB 67	Length	DB 68	Score	DB 69	Length	DB 70	Score	DB 71	Length	DB 72	Score	DB 73	Length	DB 74	Score	DB 75	Length	DB 76	Score	DB 77	Length	DB 78	Score	DB 79	Length	DB 80	Score	DB 81	Length	DB 82	Score	DB 83	Length	DB 84	Score	DB 85	Length	DB 86	Score	DB 87	Length	DB 88	Score	DB 89	Length	DB 90	Score	DB 91	Length	DB 92	Score	DB 93	Length	DB 94	Score	DB 95	Length	DB 96	Score	DB 97	Length	DB 98	Score	DB 99	Length	DB 100	Score	DB 101	Length	DB 102	Score	DB 103	Length	DB 104	Score	DB 105	Length	DB 106	Score	DB 107	Length	DB 108	Score	DB 109	Length	DB 110	Score	DB 111	Length	DB 112	Score	DB 113	Length	DB 114	Score	DB 115	Length	DB 116	Score	DB 117	Length	DB 118	Score	DB 119	Length	DB 120	Score	DB 121	Length	DB 122	Score	DB 123	Length	DB 124	Score	DB 125	Length	DB 126	Score	DB 127	Length	DB 128	Score	DB 129	Length	DB 130	Score	DB 131	Length	DB 132	Score	DB 133	Length	DB 134	Score	DB 135	Length	DB 136	Score	DB 137	Length	DB 138	Score	DB 139	Length	DB 140	Score	DB 141	Length	DB 142	Score	DB 143	Length	DB 144	Score	DB 145	Length	DB 146	Score	DB 147	Length	DB 148	Score	DB 149	Length	DB 150	Score	DB 151	Length	DB 152	Score	DB 153	Length	DB 154	Score	DB 155	Length	DB 156	Score	DB 157	Length	DB 158	Score	DB 159	Length	DB 160	Score	DB 161	Length	DB 162	Score	DB 163	Length	DB 164	Score	DB 165	Length	DB 166	Score	DB 167	Length	DB 168	Score	DB 169	Length	DB 170	Score	DB 171	Length	DB 172	Score	DB 173	Length	DB 174	Score	DB 175	Length	DB 176	Score	DB 177	Length	DB 178	Score	DB 179	Length	DB 180	Score	DB 181	Length	DB 182	Score	DB 183	Length	DB 184	Score	DB 185	Length	DB 186	Score	DB 187	Length	DB 188	Score	DB 189	Length	DB 190	Score	DB 191	Length	DB 192	Score	DB 193	Length	DB 194	Score	DB 195	Length	DB 196	Score	DB 197	Length	DB 198	Score	DB 199	Length	DB 200	Score	DB 201	Length	DB 202	Score	DB 203	Length	DB 204	Score	DB 205	Length	DB 206	Score	DB 207	Length	DB 208	Score	DB 209	Length	DB 210	Score	DB 211	Length	DB 212	Score	DB 213	Length	DB 214	Score	DB 215	Length	DB 216	Score	DB 217	Length	DB 218	Score	DB 219	Length	DB 220	Score	DB 221	Length	DB 222	Score	DB 223	Length	DB 224	Score	DB 225	Length	DB 226	Score	DB 227	Length	DB 228	Score	DB 229	Length	DB 230	Score	DB 231	Length	DB 232	Score	DB 233	Length	DB 234	Score	DB 235	Length	DB 236	Score	DB 237	Length	DB 238	Score	DB 239	Length	DB 240	Score	DB 241	Length	DB 242	Score	DB 243	Length	DB 244	Score	DB 245	Length	DB 246	Score	DB 247	Length	DB 248	Score	DB 249	Length	DB 250	Score	DB 251	Length	DB 252	Score	DB 253	Length	DB 254	Score	DB 255	Length	DB 256	Score	DB 257	Length	DB 258	Score	DB 259	Length	DB 260	Score	DB 26
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RESULT 8

ID R05789 standard; Protein; 151 AA.
 AC R05789;
 DT 22-AUG-1990 (first entry)
 DE Human aEGF encoded by synthetic gene.
 KW Acidic fibroblast growth factor; aEGF; thrombogenesis;
 KW atherosclerosis; tumors.
 OS Synthetic.
 FH Key
 FT misc_difference 146..147
 FT Location/Qualifiers
 FT /note="sites corresp. to two stop codons of
 FT the DNA sequence"
 PN GB2223496-A.
 PD 11-APR-1990.
 PF 08-AUG-1988; 018775.
 PR 08-AUG-1988; GB-018775.
 PA (BRBI-) Brit Bio-Tech Ltd.
 PI Davies JA, Johnson ID;
 DI WPI: 90-109882/15.
 DR N-PSDB; Q03873.
 PS Gene encoding human acidic fibroblast growth factor -
 PS incorporates useful restriction sites at frequent intervals to
 PS facilitate cassette mutagenesis of specified regions.
 CC Claim 2; Fig 3a; 12pp; English.
 CC The synthetic aEGF gene incorporates useful restriction sites at
 CC frequent intervals to facilitate the cassette mutagenesis of
 CC selected regions. Also included are flanking sites to simplify
 CC the incorporation of the gene into any expression system.
 CC The aEGF moi. acts in a cascade effect to control endothelial cell
 CC activity either co-ordinately through synergistic effects or via
 CC independent routes. The regulation of endothelial cells is essential
 CC for the protection of arteries, veins and capillaries from the effect
 CC of thrombogenesis. Their stimulation and control by these factors is
 CC also thought to be important in the development of tumours and
 CC atherosclerosis.
 CC Sequence 151 AA;
 SQ

Query Match 79.3%; Score 985; DB 1; Length 151;
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;
 DB 10 PGNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOY 69
 QY :|||||
 37 SANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOY 96
 DB 70 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 129
 QY :|||||
 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156
 130 YGQKAILFLPLPVSSD 145
 157 YGQKAILFLPLPVSSD 172

RESULT 9
 ID W92283 standard; protein; 154 AA.
 AC W92283;
 DT 20-APR-1999 (first entry)
 DE Human beta-endothelial cell growth factor (ECGF) protein sequence.
 KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
 KW regenerate; blood vessel; endothelial cell; human.
 OS Homo sapiens.
 FH US5849538-A.
 FT 15-DEC-1998.
 PD 11-APR-1997; 840088.
 PF 04-NOV-1996; US-743261.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PR 11-APR-1997; US-840088.
 PA (RHON) RHONE-POULENC RORER PHARM INC.

PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DT WPI: 99-069734/06.
 PT DNA encoding a cleavable signal peptide and an endothelial cell
 PT growth factor - useful for producing recombinant endothelial cell
 PT growth factor proteins
 PS Claim 1; Column 16; 23pp; English.
 CC This represents the amino acid sequence of human beta-endothelial cell
 CC growth factor (ECGF). The invention is directed to DNA encoding alpha-
 CC or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a
 CC cleavable signal peptide and an ECGF, where removal of the signal peptide
 CC yields a mature form of the ECGF. The DNA is used to produce recombinant
 CC ECGF proteins, which can be used in treatments to repair or regenerate
 CC blood vessels or other structures lined with endothelial cells.
 CC Sequence 154 AA;
 SQ

Query Match 79.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;
 DB 19 PGNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOY 78
 QY :|||||
 37 SANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOY 96
 DB 79 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 138
 QY :|||||
 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156
 139 YGQKAILFLPLPVSSD 154
 157 YGQKAILFLPLPVSSD 172

RESULT 10
 ID W04805 standard; Protein; 154 AA.
 AC W04805;
 DT 29-DEC-1996 (first entry)
 DE Human beta-endothelial cell growth factor.
 KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
 KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
 KW EGF; fibroblast growth factor.
 OS Homo sapiens.
 PN US552528-A.
 PD 03-SEP-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Maciag T;
 DT WPI: 96-412132/41.
 DR N-PSDB; T37503.
 PT Isolated, purified, biologically active bovine beta endothelial cell
 PT growth factor - useful to regenerate or treat damaged blood vessels
 PS Disclosure; Fig 8; 28pp; English.
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
 CC brain using heparin-Sepharose affinity chromatography. ECGF is
 CC useful for, among other purposes, diagnostic applications and has
 CC potential in the treatment of damaged blood vessels or other
 CC endothelial cell-lined structures.
 CC Human ECGF (T37503) or fragments may be obtained using
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
 CC on the sequence of bovine alpha- and beta-ECGF.
 CC Sequence 154 AA;
 SQ

Query Match 79.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;
 DB 19 PGNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOY 78
 QY :|||||

QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 96
 Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138
 QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156
 Db 139 YGOKAILFLPLPVSSD 154
 QY 157 YGOKAILFLPLPVSSD 172

RESULT 11

ID W06816 standard; Protein; 154 AA.
 AC W06816;
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor-beta.
 KW Endothelial cell growth factor-beta; ECGF-beta.
 OS Homo sapiens.
 PN US5571790-A.
 PR 05-NOV-1996.
 PR 03-MAR-1986; 835594.
 PR 18-DEC-1987; US-835594.
 PR 29-APR-1991; US-134499.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR N-PSDB; T45983.
 PT Recombinant human endothelial cell growth factors - for treating
 PT damaged blood vessels, etc.
 PS Claim 1: Column 16: 22pp; English.
 CC Human recombinant endothelial cell growth factors (ECGF) beta
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
 CC They can be produced in transformed prokaryotic or eukaryotic host
 CC cells using DNA sequences (T45983 and T45984, respectively) derived
 CC from the complete human ECGF cDNA (T45985). Large quantities of
 CC the ECGFs are produced by culturing the host cells and recovering
 CC the proteins. ECGFs have utility in the growth and amplification
 CC of endothelial cells in culture. They can potentially be used to
 CC treat damaged blood vessels and other endothelial cell-lined
 CC structures, and also have diagnostic applns.
 SQ Sequence 154 AA;

Query Match 79.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 98.5%; Pred. No. 2,79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 19 PGNKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 78
 QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 96
 Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138
 QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156

Query Match 79.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 98.5%; Pred. No. 2,79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 19 PGNKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 78
 QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 96
 Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138
 QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156
 Db 139 YGOKAILFLPLPVSSD 154
 QY 157 YGOKAILFLPLPVSSD 172

RESULT 12

ID W75414 standard; protein; 154 AA.
 AC W75414;
 DT 02-MAR-1999 (first entry)
 DE Human beta-endothelial cell growth factor.
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
 KW hybridisation; bovine; wound healing; prosthetic device.
 OS Homo sapiens.
 PN US5827826-A.
 PR 27-OCT-1998.

PF 04-NOV-1996; 743261.
 PR 04-NOV-1996; US-743261.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 98-594032/50.
 PT Compositions for promoting wound healing - containing endothelial
 PT cell growth factor polypeptides
 PS Claim 1: Column 16: 23pp; English.
 CC This sequence represents the amino acid sequence of the mature human
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
 CC is identical to the alpha-ECGF but the beta sequence contains an extra
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain
 CC stem cell cDNA library using a probe designed based on fragments of the
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
 CC compositions for promoting wound healing. ECGF is also used to grow
 CC cells on a prosthetic device.
 SQ Sequence 154 AA;

Query Match 79.3%; Score 985; DB 1; Length 154;
 Best Local Similarity 98.5%; Pred. No. 2,79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 19 PGNKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 78
 QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 96
 Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138
 QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156
 Db 139 YGOKAILFLPLPVSSD 154
 QY 157 YGOKAILFLPLPVSSD 172

RESULT 13

ID P94037 standard; protein; 155 AA.
 AC P94037;
 DT 25-JUN-1990 (first entry)
 DE Human acidic fibroblast growth factor.
 KW Acidic fibroblast growth factor.
 OS Homo sapiens.
 PN EP-298723-A.
 PR 11-JAN-1989.
 PR 06-JUL-1988; 306158.
 PR 07-JUL-1987; US-070797.
 PA (BIOT-) Biotechn Res Assoc.
 PI Fiddes JC, Abraham JA, Protter A;
 DR WPI; 89-009785/02.
 DR N-PSDB; N93088.
 PT Recombinant DNA encoding new fibroblast growth factor
 PT analogues - useful eg for accelerating wound healing and
 PT to control neovascularisation.
 PS Disclosure; p; English.
 CC See also P94038.
 SQ Sequence 155 AA;

Query Match 79.3%; Score 985; DB 1; Length 155;
 Best Local Similarity 98.5%; Pred. No. 2,79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 20 PGNKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 79
 QY 37 SANYKKPKLLYCSNGGHFLRLPDGTVGDRDRSDQHILQLSAESVGEVYIKSTETGOY 96
 Db 80 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 139

QY 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFVGLKNGSKRGPRTH 156
 Db 140 YGOKAILFLPLPVSSD 155
 QY 157 YGOKAILFLPLPVSSD 172

RESULT 14

ID R70812 standard; protein; 155 AA.
 AC R70812; 1995 (first entry)
 DT 01-SEP-1995
 DE FGF-1.
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
 OS Homo sapiens. Location/Qualifiers
 FH Key misc_difference 31
 FT misc_difference 132
 FT /note= "Cys may be replaced by Ser"
 FT /note= "Cys may be replaced by Ser"
 WO9503831-A.
 09-FEB-1995.
 PF 27-JUL-1994; U08511.
 PR 02-AUG-1993; US-099924.
 PR 29-OCT-1993; US-145829.
 PA (PRIZ-) PRIZM PHARM INC.
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
 FI Baird AJ, Iappi DA, Sosnowski BA;
 DR WPI; 95-082038/11.
 PT New monogenous preparations of cytotoxic conjugates and DNA -
 PT contain fibroblast growth factors and cytotoxic agents for
 PT treating FGF conditions such as tumours, diabetes and rheumatoid
 PT arthritis.
 PS Disclosure; Page 108-109; 128pp; English.
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
 CC by conservative Ser substitutions. The fusion proteins are potent
 CC cytotoxic agents to cells bearing the FGF receptor.
 CC Cytocidal agents to cells bearing the FGF receptor.
 SQ Sequence 155 AA;

Query Match 79.3%; Score 985; DB 1; Length 155;
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 20 PGNKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 79
 :|||||
 37 SANYYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96
 :|||||
 80 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFVGLKNGSKRGPRTH 139
 :|||||
 QY 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFVGLKNGSKRGPRTH 156
 :|||||
 Db 140 YGOKAILFLPLPVSSD 155
 :|||||
 QY 157 YGOKAILFLPLPVSSD 172

RESULT 15

ID P70482 standard; Protein; 155 AA.
 AC P70482;
 DT 13-MAY-1991 (first entry)
 DE Sequence encoded by complete cDNA sequence of human endothelial
 DE cell growth factor (ECGF).
 KW Endothelial cell regeneration; blood vessel regeneration.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT protein 2..15
 FT /label= Beta ECGF
 FT protein 16..21
 FT /label= Acidic FGF
 FT protein 22..155
 FT /label= Alpha ECGF

PN WO8705332-A.
 PD 11-SEP-1987.
 PF 02-MAR-1987; U00425.
 PR 03-MAR-1986; US-835594.
 PR 26-MAR-1987; ES-000812.
 PA (MELO-) MELOY LAB INC.
 PA (RORE-) RORER BIOTECHN INC.
 PA (RORE-) RORER.
 PA BIOTECH INC.
 PI Jaye W, Burgess W, Maciag T, Drohan W;
 DR WPI; 87-264128/37.
 DR N-PSDB; N70788
 PT Human endothelial cell growth factor - produced by recombinant
 PT DNA techniques, useful for wound healing
 PS Example; Fig 8; 43pp; English.
 CC To screen the human brain stem cDNA library for clones contg. ECGF
 CC inserts, a specific oligonucleotide was designed. This
 CC oligonucleotide was based upon a partial AA sequence analysis of
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
 CC forth for comparison the AA sequence of cyanogen bromide-cleaved
 CC bovine alpha and beta ECGF (P70834). The two clones that were
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
 CC nucleotide sequence of these clones and the AA sequence deduced from
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
 SQ Sequence 155 AA;

Query Match 79.3%; Score 985; DB 1; Length 155;
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 20 PGNKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 79
 :|||||
 QY 37 SANYYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96
 :|||||
 80 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFVGLKNGSKRGPRTH 139
 :|||||
 QY 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFVGLKNGSKRGPRTH 156
 :|||||
 Db 140 YGOKAILFLPLPVSSD 155
 :|||||
 QY 157 YGOKAILFLPLPVSSD 172

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MParch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 16:09:12 2000; MasPar time 10.82 Seconds
750.147 Million cell updates/sec
Regular output not generated.

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Title:
Description:
Perfect Score:
Sequence:

```

Scoring table: PAM 150
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: pir64
1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 43.226; Variance 75.292; scale 0.574

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	DB	ID	Description	Pred. No.
1	985	79.3	155	1	A33665	acidic fibroblast-gro	3.91e-199
2	968	77.9	155	1	A60721	acidic fibroblast gro	4.47e-195
3	966	77.18	155	2	D37360	acidic fibroblast gro	1.34e-194
4	966	77.8	155	2	S04147	acidic fibroblast gro	1.34e-194
5	954	76.8	152	2	H04076	acidic fibroblast gro	9.79e-182
6	917	73.8	155	1	GK80A	acidic fibroblast gro	6.43e-183
7	916	73.8	155	2	A60130	acidic fibroblast gro	1.11e-182
8	906	72.9	155	2	DJ0055	fibroblast growth fac	2.67e-180
9	531	42.8	186	1	A48834	basic fibroblast grow	2.60e-92
10	529	42.6	149	1	S00185	basic fibroblast grow	7.50e-92
11	525	42.3	157	1	GK80B	basic fibroblast grow	6.23e-91
12	518	41.7	210	2	A32398	basic fibroblast grow	2.52e-89
13	513	41.3	154	2	C37360	basic fibroblast grow	3.53e-88
14	513	41.3	154	2	S11674	basic fibroblast grow	3.53e-88
15	500	40.3	164	2	S31622	basic fibroblast grow	3.35e-85
16	494	39.8	155	1	A40117	basic fibroblast grow	7.88e-84
17	475	38.2	137	2	I45711	fibroblast growth fac	1.70e-79
18	350	28.2	208	2	A48137	fibroblast growth fac	1.79e-51
19	350	28.2	208	2	S66486	fibroblast growth fac	1.79e-51
20	329	26.5	207	2	JC5941	fibroblast growth fac	7.12e-47
21	324	26.1	207	2	JC5940	fibroblast growth fac	8.175e-46
22	302	24.1	194	2	A49501	keratinocyte growth f	5.06e-41
23	299	24.1	194	1	A36301	fibroblast growth fac	2.24e-40

```

#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title        Alternative splicing generates two forms of mRNA coding for
#             human heparin-binding growth factor 1.
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
#accession     A43804
#molecule_type mRNA
#residues      1-155 #label CHI
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#authors      Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
              Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
              Drohan, W.N.
#journal      Science (1986) 233:541-545
#title        Human endothelial cell growth factor: cloning, nucleotide
#             sequence, and chromosome localization.
#cross-references MUID:86261805
#accession     A24662
#molecule_type mRNA
#residues      1-155 #label JAY
#cross-references GB:MI3361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielsen, A.A.J.; Goetzl,
              E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title        An acidic fibroblast growth factor protein generated by
#             alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession     JH0707
#molecule_type mRNA
#residues      1-155 #label YUY
#cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#authors      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
              S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title        Cloning of two novel forms of human acidic fibroblast growth
#             factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession     S35535
#status        translation not shown
#molecule_type mRNA
#residues      1-58 #label PAY
#cross-references GB:L01485
#accession     S35536
#status        translation not shown
#molecule_type mRNA
#residues      1-58 #label PA2
#cross-references GB:L01487
REFERENCE
#authors      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title        The gene for human acidic fibroblast growth factor encodes
#             two upstream exons alternatively spliced to the first
#             coding exon.
#cross-references MUID:90365758
#accession     I39413
#status        translation not shown
#molecule_type mRNA
#residues      1-40 #label RES
#cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
              GB:M60516; NID:g178232; PID:g553171
REFERENCE
#authors      Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession     A23553
#molecule_type protein
#residues      16-155 #label HAR
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title        The complete amino acid sequence of human brain-derived
              acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession     A24820
#molecule_type protein
#residues      16-155 #label GIM
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
              factors: amino terminal sequences and specific mitogenic
              activities.
#cross-references MUID:86186784
#accession     A24243
#molecule_type protein
#residues      16-47 #label GI2
#experimental_source brain
#accession     A91364
#authors      Gautschi, P.; Prater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
              mitogens from human brain: acidic and basic fibroblast
              growth factors.
#cross-references MUID:86275260
#accession     A24301
#molecule_type protein
#residues      16-30, 'X', 32-49 #label GAU
REFERENCE
#authors      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title        Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession     A26386
#molecule_type protein
#residues      16-155 #label GA2
#experimental_source brain
#accession     A53639
#authors      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
              Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
              Middaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title        Interaction of nucleotides with acidic fibroblast growth
              factor (FGF-1).
#cross-references MUID:94271773
#accession     A53639
#molecule_type protein
#residues      16-30, 'X', 32-38; 73-75, 'X', 77-97, 'X', 99-101; 128-131, 'X',
              133-140, 'X', 142-152 #label CHA
GENETICS
#gene          GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position  5q31.3-5q33.2
#introns       57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS        alternative splicing; growth factor; heparin binding
FEATURE
16-155         #product fibroblast growth factor 1 #status experimental
               #label HAR\
129            #binding_site carbohydrate (Asn) (covalent) #status
               absent
SUMMARY         #length 155 #molecular-weight 17460 #checksum 9243
Query Match    79.38; Score 985; DB 1; Length 155;
Best Local Similarity 98.5%; Pred. No. 3.91e-199;
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;
Db 20 PGNYKPKLLYCSNGGHFLRILPDGTVDRSDHQIQLQLSAESVGEYVIKSTEGQY 79
QY 37 SANYKPKLLYCSNGGHFLRILPDGTVDRSDHQIQLQLSAESVGEYVIKSTEGQY 96
Db 80 LAMDTGLLYGSGTPTNEECLEFLERLEENHYNTYISKKAHEKNFVGLKKNKSGCKRGPRTH 139
QY 97 LAMDTGLLYGSGTPTNEECLEFLERLEENHYNTYISKKAHEKNFVGLKKNKSGCKRGPRTH 156

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```
Db 140 YGOKAILFLPLPVSSD 155
|||||
Qy 157 YGOKAILFLPLPVSSD 172

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell arGF/HGBF-I gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 77.9%; Score 968; DB 1; Length 155;
Best Local Similarity 96.3%; Pred. No. 4.47e-195;
Matches 131; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 20 PGNYKPKLLYCSNGHFRILPDGTVDRSDQHIOQLSAESAGEVYIKGTGTGOYL 79
:|||||
Qy 37 SANIKPKLLYCSNGHFRILPDGTVDRSDQHIOQLSAESAGEVYIKGTGTGOYL 96
:|||||

Db 80 LAMDTGLLYGSQTPNEECLFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTH 139
|||||
Qy 97 LAMDTGLLYGSQTPNEECLFLERLEENHYNTYISKKHAEKNWFVGLKKNKSGCKRGPRTH 156
|||||

Db 140 YGOKAILFLPLPVSSD 155
|||||
Qy 157 YGOKAILFLPLPVSSD 172

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES arGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE A37360
#authors Hebert, J.M.; Basilio, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:N30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
JC5231
#authors Madal, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
```

```
##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
disease including atherosclerosis, cancer and inflammatory
autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 77.8%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.34e-194;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGHFRILPDGTVDRSDQHIOQLSAESAGEVYIKGTGTGOYL 80
:|||||
Qy 38 ANYKPKLLYCSNGHFRILPDGTVDRSDQHIOQLSAESAGEVYIKGTGTGOYL 97
:|||||

Db 81 AMDTEGLLYGSQTPNEECLFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTH 140
|||||
Qy 98 AMDTDGLLYGSQTPNEECLFLERLEENHYNTYISKKHAEKNWFVGLKKNKSGCKRGPRTH 157
|||||

Db 141 GOKAILFLPLPVSSD 155
|||||
Qy 158 GOKAILFLPLPVSSD 172

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147

##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 77.8%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.34e-194;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGHFRILPDGTVDRSDQHIOQLSAESAGEVYIKGTGTGOYL 80
:|||||
Qy 38 ANYKPKLLYCSNGHFRILPDGTVDRSDQHIOQLSAESAGEVYIKGTGTGOYL 97
:|||||

Db 81 AMDTEGLLYGSQTPNEECLFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTH 140
|||||
Qy 98 AMDTDGLLYGSQTPNEECLFLERLEENHYNTYISKKHAEKNWFVGLKKNKSGCKRGPRTH 157
|||||

Db 141 GOKAILFLPLPVSSD 155
|||||
Qy 158 GOKAILFLPLPVSSD 172

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
```

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#protein fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal
133 #binding site heparin (lys) #status predicted
SUMMARY
#length 152 #checksum 1124
Query Match 76.8%; Score 954; DB 2; Length 152;
Best Local Similarity 96.2%; Pred. No. 9,79e-192;
Matches 128; Conservative 3; Mismatches 2; Indels 0; Gaps 0;
Db 20 PGNKKPKLYCSNGHFLRLPDGTGTRDRSDHQIQLSAESVGEVYIKSTETGQY 79
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 37 SANYKKPKLYCSNGHFLRLPDGTGTRDRSDHQIQLSAESVGEVYIKSTETGQY 96
Db 80 LAMDTGLLYGSQTPSECLFLERLEENHNTYTSKHAENWFVGLKNGSKRGPRTH 139
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 97 LAMDTGLLYGSQTPSECLFLERLEENHNTYTSKHAENWFVGLKNGSKRGPRTH 156
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 140 YGQRAILFLPLPV 152
QY 157 YGQRAILFLPLPV 169
RESULT 6
ENTRY GKBOA #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
#date 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
ESSIONS JH0613; S02102; S02661; S22065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE JH0613
#authors Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts.
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

```

```

Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submision submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE A94281
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Armes, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 'S-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
##molecule_type protein
##residues 2-155 #label BUR
##note this form was designated beta endothelial cell growth factor

#accession C25043
##molecule_type protein
##residues 16-155 #label BU2
##note this form was designated acidic fibroblast growth factor

#accession A25043
##molecule_type protein
##residues 22-155 #label BU3
##note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
Strydom, D.J.; Harper, J.W.; Lobb, R.R.
Biochemistry (1986) 25:945-951
#journal
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
##molecule_type protein
##residues 16-155 #label STR

REFERENCE
A60884
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
J. Protein Chem. (1987) 6:163-171
#journal
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.

#accession A60884
##molecule_type protein
##residues 16-155 #label THO

REFERENCE
A37892
Kuo, M.D.; Huang, S.S.; Huang, J.S.
J. Biol. Chem. (1990) 265:16455-16463
#journal
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
##molecule_type protein
##residues 22-30,'X',32-38 #label KU2
##note this form was designated brain-derived growth factor A

#accession B37892
##molecule_type protein
##residues 62-76,'X',78-86 #label KUO
##note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE
A61198
Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
Brain Res. Dev. Brain Res. (1991) 63:13-19
#journal
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.
#cross-references MUID:92164087
#accession A61198
##molecule_type protein
##residues 11-26;28-50;53-110,'H',112,'NTY';134-155 #label HIL

REFERENCE
I46024
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
Biochem. Biophys. Res. Commun. (1992) 188:843-850
#journal
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
##status translated from GB/EMBL/DBJ
##molecule_type mRNA
##residues 1-18 #label PH2
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
#accession A34477
Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

```

```

Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17608-17612
#journal
#title Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
##status preliminary
##molecule_type protein
##residues 16-24;121-127;134-143 #label SAS
##experimental_source heart

COMMENT
The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.

COMMENT
This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-126 (a region flanked by Lys-Lys dipeptides) and a number of neuropeptides, including a gastrin-releasing peptide from the pig

...
Note: remainder of annotations omitted.

```

```

Query Match 73.8%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 6.43e-183;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGYFLRLPDPGVDTGDKRSDQRIQLQCAESIGEVYIKSTGTGQPL 80
QY :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
38 GNYKPKLLYCSNGGHFLRLPDPGVDTGTRDSQHIQLQLSAESVGEVYIKSTGTGQYL 97
Db 81 AMDTGLLYGSOTPNBECLEFLERLEENHYIYISKKHAEKHFVGLKNGRSKLGPRTHF 140
QY :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
98 AMDTGLLYGSOTPNBECLEFLERLEENHYIYISKKHAEKHFVGLKNGRSKLGPRTHY 157
Db 141 GOKAILFLPLPVSSD 155
QY :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
158 GOKAILFLPLPVSSD 172

```

```

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##cross-references GB:S63263; NID:g234372; PIDN:AB15629.1; PID:g234373
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
##molecule_type protein
##residues 22-30,'X',32-44,'X',46-48 #label RIJ
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

```



```

Db 63 VSIKGCANYLAWKEDGRLLASKCVTDECFFERLESNNYTRSKKYS--SWYVALKR 120
| | | : : | | | | | | | : | | | | | | | : | | | | | : | | | | | :
QY 86 VYIKSTETGOYLANDTDGLYSGTNEPCECLFLERLEENHYNTYISKHAEKNWFVGLKK 145
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Db 121 TGOYKLGPKTGPCKAKLFLPMSAKS 146
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
QY 146 NGSKRGPRTHYGOKALLFLPVPSS 171
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

RESULT 11
ENTRY GKB0B #type fragment
TITLE basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES bFGF; kidney-derived growth factor; prostatiropin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS A24663; A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
REFERENCE
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
#molecule_type mRNA
#residues 3-157 #label ABR
#cross-references GB:M13440; NID:g163049; PIDN:AAA30518.1; PID:g163050
#experimental_source pituitary gland
#accession A90924
REFERENCE
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession A32878
#molecule_type mRNA
#residues 3-157 #label AB2
REFERENCE
#authors Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel,
N.R.; Deuel, T.F.
#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
bovine uterus: purification and N-terminal amino acid
sequence.
#cross-references MUID:90121211
#accession A33784
#molecule_type protein
#residues 1-14 #label MIL
#note demonstration of a possible alternative initiator or
splice junction
REFERENCE
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterization and tissue localisation of an
N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
#molecule_type protein
#residues 16-35 #label BER
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
#molecule_type protein
#residues 27-35,'X',37-41 #label UE3
#experimental_source testes
#note this form appears to be identical to the renal form

```

```

REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
factor from bovine liver: structural homology with basic
fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
#molecule_type protein
#residues 23-35,'X',37-42 #label UEN
#experimental_source liver
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
fibroblast growth factor.
#cross-references MUID:86295737
#accession A61094
#molecule_type protein
#note the amino end of this form was blocked; the peptide
composition matched what was thought to be the signal
sequence
REFERENCE
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
Bohlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
#molecule_type protein
#residues 12-25;27-35,'X',37-40 #label GOS
#experimental_source adrenal gland
REFERENCE
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
factor (bFGF) and comparison with the amino-terminal
sequence of bovine brain acidic bFGF.
#cross-references MUID:86016731
#accession A01386
#molecule_type protein
#residues 12-157 #label ESC
#experimental_source pituitary gland
REFERENCE
#authors Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
growth factor from the bovine kidney: homology with basic
fibroblast growth factor.
#cross-references MUID:86095426
#accession A60316
#molecule_type protein
#residues 27-35,'X',37-43 #label BAI
#experimental_source kidney
REFERENCE
#authors Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
#molecule_type protein
#residues 12-26 #label BOH
#experimental_source
COMMENT The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells).
COMMENT This protein binds heparin more strongly than does aFGF.

```

```

CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified_site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
#length 157 #checksum 1115

QUERY
Query Match 42.3%; Score 525; DB 1; Length 157;
Best Local Similarity 52.7%; Pred. No. 6.23e-91;
Matches 77; Conservative 26; Mismatches 41; Indels 2; Gaps 1;

Db 14 LPEDGGGAPPGHFKDPKRLYCKNGGFFLRHPDGRVDGVREKSDPHIKLOQAEERG 73
QY 26 VPSFAGARANGSANKPKLKYCSNGGFFLRHPDGRVDGVREKSDPHIKLOQAEERG 85
Db 74 VSIRGVCANRYLAKMDGRLASCVTDECFERLESNNYTYRSKYS--SWYVALKR 131
QY 86 VYIKSTGTQYLANDTGLLYGSGTPTNEECFLERLEENHYNTYISKHAENWFGLKK 145
Db 132 TGQKLGPKTGPQKAILFLPMSAKS 157
QY 146 NGSCRGPRTHYGOKAILFLPLVSS 171

RESULT 12
ENTRY A32398 #type complete
TITLE basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostaticin
CONTAINS basic fibroblast growth factor, 18K form
ORGANISM #formal_name Homo sapiens #common_name man
DATE 31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
#cross-references A61537; A26642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
REFERENCE A32398
#authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues 1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE A61537
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal Growth Factors (1991) 4:277-287
#title Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues 1-114 #label SHI
#note authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues 56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE A30924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX',86-88,'X',90-91,'X',93-95 #label SH3
#note experimental_source C-Li21 hepatocellular carcinoma cell line
sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues 'XXX',19,'X',21-29 #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI
REFERENCE A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

```

```

#accession S46253
#molecule_type protein
#residues 39-53;65-88 #label PAT
#note recombinant gene expressed in Escherichia coli

GENETICS
#gene GDB:FGF2; FGFB
#cross-references GDB:I19910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative initiators; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-210 #product basic fibroblast growth factor, 22.5K form
#status predicted #label MA2\
65-210 #product basic fibroblast growth factor, 18K form
#status predicted #label MAT\
82-86 #region heparin binding #status predicted\
171-174 #region heparin binding #status predicted
SUMMARY #length 210 #molecular-weight 22623 #checksum 3610

Query Match 41.7%; Score 518; DB 2; Length 210;
Best Local Similarity 52.1%; Pred. No. 2,52e-89;
Matches 76; Conservative 27; Mismatches 41; Indels 2; Gaps 1;

Db 67 LPEDGGGAPPGHFDPKRLKCKNGGFFLRHPDGRVDGVREKSDPHKIQLOQAERG 126
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
26 VSPAGARANGSANYKKPKLLKCSNGGHFLRILPDGTVDGTRDRSDPHIQLOLSAESVGE 85

Db 127 VSKIGVCANYLAWKEDGRLLASKVTCDFCFERLESNNYTYRSKYT--SWYVALKR 184
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
86 VYKSTETGYLAMD7DGLYGSGTNEECFLERLEENHYNTYISKHAEKNWFVGLKK 145

Db 185 TGOYKLGSKTGPCKAILFLPMSAKS 210
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
146 NGSKRGRTHYGKAILFLPVS 171

RESULT 13
ENTRY C37360 #type complete
TITLE basic fibroblast growth factor - mouse
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS C37360
REFERENCE C37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis
#cross-references MUID:90201563
#accession C37360
##status preliminary
##molecule_type mRNA
##residues 1-154 #label HEB
#cross-references GB:X30644; NID:g193296; PID:AAA37621.1; PID:g309239
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 154 #molecular-weight 17153 #checksum 2906

Query Match 41.3%; Score 513; DB 2; Length 154;
Best Local Similarity 52.7%; Pred. No. 3,53e-88;
Matches 77; Conservative 26; Mismatches 40; Indels 3; Gaps 2;

Db 12 LPEDGGA-APPGHFKDPKRLKCKNGGFFLRHPDGRVDGVREKSDPHVKLOQAERG 70
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
26 VSPAGARANGSANYKKPKLLKCSNGGHFLRILPDGTVDGTRDRSDPHIQLOLSAESVGE 85

Db 71 VSKIGVCANYLAWKEDGRLLASKVTCDFCFERLESNNYTYRSKYT--SWYVALKR 128
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
86 VYKSTETGYLAMD7DGLYGSGTNEECFLERLEENHYNTYISKHAEKNWFVGLKK 145

```

```
RESULT 15
ENTRY S31622 #type fragment
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[W][O][R][L][D]
[P][R][O][T][E][I][N]
[S][E][Q][U][E][N][C][E]
[A][N][A][L][Y][S][I][S]
[S][Y][S][T][E][M]
[I][N]
[T][H][E]
[U][N][I][V][E][R][S][I][T][Y]
[O][F]
[E][D][I][N][B][U][R][G][H]
[U][K]
[T][M]

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MPSrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 16:06:59 2000; Maspar time 7.03 Seconds
757.906 Million cell updates/sec
Abular output not generated.

Title: >US-09-121-017B-25
Description: ~~1242~~ from US09121017B.ppt
Perfect Score: 1242
Sequence: 1 MSRGAGRVQGTQLQALVFLGV.....PRTHYGQKAILFLPLPVSSD 172

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: swiss-prot38
1:swissprot

Statistics: Mean 44.068; Variance 67.544; scale 0.652

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Query Match	Length	ID	Description	Pred. No.
1	985	79.3	155	1 FGF1_HUMAN HEPARIN-BINDING GROWTH	4.56e-226
2	968	77.9	155	1 FGF1_MESAU HEPARIN-BINDING GROWTH	1.85e-221
3	966	77.8	155	1 FGF1_MOUSE HEPARIN-BINDING GROWTH	6.43e-221
4	954	76.8	152	1 FGF1_PIG HEPARIN-BINDING GROWTH	1.14e-217
5	917	73.8	155	1 FGF1_BOVIN HEPARIN-BINDING GROWTH	1.16e-207
6	916	73.8	155	1 FGF1_CHICK HEPARIN-BINDING GROWTH	2.17e-207
7	531	42.8	158	1 FGF2_SHEEP HEPARIN-BINDING GROWTH	7.37e-105
8	529	42.6	155	1 FGF2_SHEEP HEPARIN-BINDING GROWTH	2.45e-104
9	525	42.3	155	1 FGF2_BOVIN HEPARIN-BINDING GROWTH	2.70e-103
10	518	41.7	155	1 FGF2_HUMAN HEPARIN-BINDING GROWTH	1.79e-101
11	513	41.3	154	1 FGF2_MOUSE HEPARIN-BINDING GROWTH	3.58e-100
12	513	41.3	154	1 FGF2_RAT HEPARIN-BINDING GROWTH	3.58e-100
13	500	40.3	156	1 FGF2_MONDO HEPARIN-BINDING GROWTH	8.48e-97
14	494	39.8	155	1 FGF2_XENLA HEPARIN-BINDING GROWTH	3.05e-95
15	475	38.2	137	1 FGF2_RABBIT GLIA-ACTIVATING FACTOR	2.49e-90
16	360	29.0	209	1 FGF9_XENLA GLIA-ACTIVATING FACTOR	4.50e-61
17	350	28.2	208	1 FGF9_HUMAN GLIA-ACTIVATING FACTOR	1.41e-58
18	350	28.2	208	1 FGF9_MOUSE GLIA-ACTIVATING FACTOR	1.41e-58
19	329	26.5	207	1 FGF6_HUMAN FIBROBLAST GROWTH FACT	2.28e-53
20	324	26.1	207	1 FGF6_RAT FIBROBLAST GROWTH FACT	3.90e-52
21	324	26.1	207	1 FGF7_SHEEP KERATINOCYTE GROWTH FA	9.58e-47
22	302	24.3	194	1 FGF7_HUMAN KERATINOCYTE GROWTH FA	5.15e-46
23	299	24.1	194	1 FGF7_HUMAN KERATINOCYTE GROWTH FA	5.15e-46

3
RESULT ID FGF1-MOUSE . STANDARD; PRT; 155 AA.
AC P10935;
AD 01-JUL-1989 (Rel. 11, Created)
DT 01-JUL-1989 (Rel. 11, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF).
GN FGF1 OR FGF-1 OR FGFA.
OS Mus musculus (Mouse), and Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Euthiria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
CC SEQUENCE FROM N.A.
RC SPECIES=RAT;
RX MEDLINE; 89240051.
RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
RT "The nucleotide sequence of rat heparin binding growth factor 1
RH (HBGF-1).";
RL Nucleic Acids Res. 17:2867-2867(1989).
RN [2]
RP SEQUENCE FROM N.A.
RC SPECIES=MOUSE;
RX MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RH characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
RN [3]
RP SEQUENCE FROM N.A.
RC SPECIES=MOUSE;
RX MEDLINE; 97128312.
RA Madial F., Hackshaw K.V., Chiu I.M.;
RT "Cloning and characterization of the mouse Fgf-1 gene.";
RH Gene 179:231-236(1996).
RN [4]
RP SEQUENCE FROM N.A.
RC SPECIES=MOUSE; STRAIN=BALE/C;
RX MEDLINE; 97094746.
RA Alam K.Y., Frostholt A., Hackshaw K.V., Evans J.E., Rotter A.,
RH Chiu I.M.;
RT "Characterization of the 1B promoter of fibroblast growth factor 1
RH and its expression in the adult and developing mouse brain.";
RL J. Biol. Chem. 271:30263-30271(1996).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; X14232; CAA32448.1; -
CC EMBL; M30641; AAA37618.1; -
CC EMBL; U36450; AAC52969.1; -
CC EMBL; U36457; AAC52969.1; JOINED.
CC EMBL; U36458; AAC52969.1; JOINED.
CC EMBL; U67610; AAC52907.1; -
CC PIR; S04147; S04147.
CC PIR; D37360; D37360.
CC HSP; P05230; ZAXM.
CC MGD; MGI:95515; FGF1.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; ILIHGFG.

DR PRINTS; PRO0263; HBGFEGF;
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0EBA4161 CRC64;

Query Match 77.8%; Score 966; DB 1; Length 155;
Best Local Similarity 96.3%; Pred. No. 6.43e-221;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESAGEVIKSTETGQYL 80
QY 38 ANYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESAGEVIKSTETGQYL 97
Db 81 AMDEGLYGSQTPNECLFLERLEENHYNTYTSKHAENWVGLKKNCKRGPRTHY 140
QY 98 AMDTGGLYGSQTPNECLFLERLEENHYNTYTSKHAENWVGLKKNCKRGPRTHY 157
Db 141 GQKAILFLPLVSSD 155
QY 158 GQKAILFLPLVSSD 172

RESULT 4
ID FGF1_PIG STANDARD; PRT; 152 AA.
AC P20002;
DT 01-FEB-1991 (Rel. 17, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR)
DE (FRAGMENT).
GN FGF1 OR FGF-1.
OS Sus scrofa (Pig).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=HEART;
RX MEDLINE; 92062117.
RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;
RT "Amplification and sequencing of mRNA encoding acidic fibroblast
RT growth factor (aFGF) from porcine heart."
RL Biochem. Biophys. Res. Commun. 180:853-859(1991).
[2]
RP SEQUENCE OF 22-41.
RC MEDLINE; 89231704.
RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethe N.,
RA Sharma H.S., Schaper W.;
RT "Isolation of heparin-binding growth factors from bovine, porcine and
RT canine hearts."
RL Eur. J. Biochem. 181:67-73(1989).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES BGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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EMBL; X60317; CAA42869.1; -.

DR PIR; S03954; S03954.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.
FT CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
FT CONFLICT 31 31 C -> S (IN REF. 2).
FT CONFLICT 39 39 R -> Y (IN REF. 2).
FT NON_TER 152 152
SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 76.8%; Score 954; DB 1; Length 152;
Best Local Similarity 96.2%; Pred. No. 1.14e-217;
Matches 128; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 20 PGNYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESAGEVIKSTETGQY 79
QY 37 SANYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESAGEVIKSTETGQY 96
Db 80 LAMDTGGLYGSQTPNECLFLERLEENHYNTYTSKHAENWVGLKKNCKRGPRTH 139
QY 97 LAMDTGGLYGSQTPNECLFLERLEENHYNTYTSKHAENWVGLKKNCKRGPRTH 156
Db 140 YGQKAILFLPLPV 152
QY 157 YGQKAILFLPLPV 169

RESULT 5
ID FGF1_BOVIN STANDARD; PRT; 155 AA.
AC P03968;
DT 23-OCT-1986 (Rel. 02, Created)
DT 01-MAR-1989 (Rel. 10, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR
DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF
DE II).
GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Bovinae; Bos.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=RETINA.
RX MEDLINE; 89083506.
RA Halley C., Courtois Y., Laurent M.;
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cdna."
RL Nucleic Acids Res. 16:10913-10913(1988).
RN [2]
RP SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89078619.
RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
RT "Characterization of a bovine acidic FGF cdna clone and its
RT expression in brain and retina."
RL FEBS Lett. 242:41-46(1988).
RN [3]
RP SEQUENCE OF 2-155.
RX MEDLINE; 87016918.
RA Burgess W.H., Mehrlan T., Marshak D.R., Fraser B.A., Maciag T.;
RT "Structural evidence that endothelial cell growth factor beta is the
RT precursor of both endothelial cell growth factor alpha and acidic
RT fibroblast growth factor."
RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
RN [4]
RP SEQUENCE OF 2-155.
RX MEDLINE; 87026586.


```
RESULT 11
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-JAN-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=OVARY;
RX MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RA "Isolation of cDNAs encoding four mouse FGF family members and
RA characterization of their expression patterns during embryogenesis.";
RA Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC
CC EMBL; M30644; AAA37621.1; -
CC PIR; C37360; C37360.
CC MGD; MGI:95516; FGF2.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGF_FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
CHAIN 10 154
BINDING 26 30 HEPARIN-BINDING GROWTH FACTOR 2.
BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

Query Match
Best Local Similarity 52.7%; Pred. No. 3.58e-100;
Matches 77; Conservative 26; Mismatches 40; Indels 3; Gaps 2;

Db 12 LPEDGGA-AFPQGHFKDKRLCKNGGFLRTHPDGVDGVRKSDPHVYKQLQAEERGCV 70
QY : ||| : : : ||| ||| ||| ||| ||| ||| : : ||| |
26 VPSAGARANGSANYKKPKLLYCSNGGFLRLPDCTVDGTRDRSDQHIQLQLSAESVGE 85
Db 71 VSLKGVCANRYLAKMKGEDGRLASKCVTECFERLESNNYNTYRSKYS--SWYVALKR 128
QY : ||| : : : ||| ||| ||| ||| ||| ||| : : ||| : : ||| : : ||| : :
86 VIKSTETQYLDMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENKWFVGLKK 145
Db 129 TGOYKLGSKTGPCQKAILFLPMSAKS 154
QY : ||| : : : ||| ||| ||| ||| ||| ||| : : ||| : : ||| : : ||| : :
146 NGSCRGEPETHYQKAILFLPVS 171

RESULT 12
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 13-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=OVARY;
RX MEDLINE; 89061721.
RA Shimazaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RA "Complementary DNA cloning and sequencing of rat ovarian basic
RA fibroblast growth factor and tissue distribution study of its mRNA.";
RA Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RC TISSUE=BRIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RA "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
RA Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
RA "Cloning of the rat fibroblast growth factor-2 promoter region and
RA its response to mitogenic stimuli in glioma C6 cells.";
RA J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=BRIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu P.C.;
RA "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
RA mRNA containing a unique 3' untranslated region.";
RA Blochm. Biophys. Acta 1131:314-316(1992).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC
CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876.
CC PIR; A31674; A31674.
CC HSSP; P09038; 1BFF.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGF_FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
CHAIN 10 154
BINDING 26 30 HEPARIN-BINDING GROWTH FACTOR 2.
BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;
```

FT BINDING 26 30 HEPARIN (POTENTIAL).
 FT BINDING 115 118 HEPARIN (POTENTIAL).
 SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match 41.3%; Score 513; DB 1; Length 154;
 Best Local Similarity 49.7%; Pred. No. 3.58e-100;
 Matches 76; Conservative 29; Mismatches 46; Indels 2; Gaps 1;

Db 4 GSITSLPAPDGGGAFPPGFKRKYCKNGGFFLRHPDGRVDGVRKSDPHVKLQL 63
 QY 19 GVLGVWVPSPAGARANGSANYKKKLLYCSNGHFLRLPDGTGDRSDQHILQL 78
 Db 64 QAEGRVSIKGVANCYRLAMKEDRLASKVTECFERLESNNYTSRKYSS--S 121
 QY 79 SAESVGEVYIKSTGTQYLLDGLLYSGQTPNEECLFLERLEENHYNTYISKHAEKN 138
 Db 122 WYVALKRTQYKLGSKTGPQKAILFLPMSAKS 154
 QY 139 WYVGLKNGSCRGPRTHYGOKAILFLPLPVSS 171

RESULT 13
 ID FGF2 MONDO STANDARD; PRT; 156 AA.
 AC P48798;
 DT 01-FEB-1996 (Rel. 33, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2.
 OS Monodelphis domestica (Short-tailed grey opossum).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-EYE;
 RX MEDLINE; 94296558.
 RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;
 RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica";
 RL DNA Cell Biol. 13:549-554(1994).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC EMBL; Z15154; CA78854.1; ALT_INIT.
 DR HSP; P09038; IBEF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 DR PRINTS; PR00263; HBGFFGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9 BY SIMILARITY.
 FT CHAIN 10 156 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 28 32 HEPARIN (POTENTIAL).
 FT BINDING 117 120 HEPARIN (POTENTIAL).
 SQ SEQUENCE 156 AA; 17303 MW; 7E655FCC49BF1209 CRC64;

Query Match 40.3%; Score 500; DB 1; Length 156;
 Best Local Similarity 52.8%; Pred. No. 8.48e-97;

Matches 75; Conservative 25; Mismatches 40; Indels 2; Gaps 1;

Db 17 GGGAFPPGFKRKYCKNGGFFLRHPDGRVDGVRKSDPHVKLQLAERGWSIK 76
 QY 30 AGARANGSANYKKKLLYCSNGHFLRLPDGTGDRSDQHILQLSAESGEVYIK 89
 Db 77 GVCANRYLAMKEDRLALKVYTECFERLESNNYTSRKYSS--NWYVALKRTQY 134
 QY 90 STGTQYLLDGLLYSGQTPNEECLFLERLEENHYNTYISKHAEKNWVGLKNGSC 149
 Db 135 KLGSKTGPQKAILFLPMSAKS 156
 QY 150 KRGPRTHYGOKAILFLPLPVSS 171

RESULT 14
 ID FGF2_XENLA STANDARD; PRT; 155 AA.
 AC P12226;
 DT 01-OCT-1989 (Rel. 12, Created)
 DT 01-JAN-1990 (Rel. 13, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).
 GN FGF2 OR FGF-2.
 OS Xenopus laevis (African clawed frog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae;
 OC Xenopodinae; Xenopus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 89058621.
 RA Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;
 RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer";
 RL Science 242:1053-1056(1988).
 RN [2]
 RP SEQUENCE OF 95-155 FROM N.A.
 RX MEDLINE; 88052890.
 RA Kimelman D., Kirschner M.;
 RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early xenopus embryo";
 RL Cell 51:869-877(1987).
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC EMBL; M18067; AAA49726.1;
 DR PIR; A29618; A29618.
 DR PIR; A40117; A40117.
 DR HSP; P09038; IBEF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 DR PRINTS; PR00263; HBGFFGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 27 31 HEPARIN (POTENTIAL).
 FT BINDING 116 119 HEPARIN (POTENTIAL).
 FT CONFLICT 111 111 MISSING (IN REF. 2).
 SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 39.8%; Score 494; DB 1; Length 155;
 Best Local Similarity 48.1%; Pred. No. 3.05e-95;
 Matches 74; Conservative 30; Mismatches 47; Indels 3; Gaps 2;

Db 4 GSITLTPTSESDGNTFFSPGSKDKRLKCKNGGFFLRINSGRVDGGRKSDSHIKLQ 63
QY 19 GLVGVMPVSPAGARAN-GSANYKKPKLLYCSNGGHLRLPDGTVDGTRDSQHIQLQ 77
Db 64 LOAVERGVSIKIGITANRYLAKMEDGRSLRITCECFERLEANNNTYRSRYS-- 121
QY 78 LSAESVGEVIKSTGTQYLAAMDGLLYGSQTPNECLFLERLEENHYNTYISKHAEK 137
Db 122 SWYVAKRTGQYKNGSGTGPQKAILFLPMSAKS 155
QY 138 NWFVGLKNGSCRGPRTHYQKAILFLPLPVSS 171

RESULT 15

ID FGF2_RABIT STANDARD; PRT; 137 AA.
AC P48759;
DT 01-FEB-1996 (Rel. 33, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DT HEPARIN-BINDING GROWTH FACTOR 2 (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BEGF) (PROSTATROPIN) (FRAGMENT).
QY FGF2.
OS Oryctolagus cuniculus (Rabbit).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-NEW ZEALAND WHITE; TISSUE-SMOOTH MUSCLE;
RX MEDLINE; 93343209.
RA Winkles J.A., Friesel R., Alberts G.F., Janat M.F., Liau G.;
RT "Elevated expression of basic fibroblast growth factor in an immortalized rabbit smooth muscle cell line";
RL Am. J. Pathol. 143:518-527(1993).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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CC -----
EMBL; L12034; AAA31248.1; -
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF; 1.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT BINDING 18 22 HEPARIN (POTENTIAL).
FT BINDING 107 110 HEPARIN (POTENTIAL).
FT NON_TER 137 137
SQ SEQUENCE 137 AA; 15418 MW; 0D9EE457B88E8C51 CRC64;

Query Match 38.2%; Score 475; DB 1; Length 137;
Best Local Similarity 51.8%; Pred. No. 2.49e-90;
Matches 71; Conservative 25; Mismatches 39; Indels 2; Gaps 1;
Db 3 LPEDGGGAPPPGKPKLCKNGGFFLRINHPDGRVGVREKSDPHIKLQQAERG 62
QY 26 VPSAGARANGSANYKKPKLLYCSNGGHLRLPDGTVDGTRDSQHIQLSAESVGE 85
Db 63 VSIKGVCANRYLAKMEDGRSLRITCECFERLENNNTYRSRYS--SWYVALKR 120
QY 86 VYKSTGTQYLAAMDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKK 145
Db 121 TGQYKLGSKTGPQKAI 137

OY 146 NGSKRGPRTHYQKAI 162
Search completed: Tue Aug 29 16:07:31 2000
Job time : 32 secs.

M O S R E H

(TM)

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 16:07:49 2000; MasPar time 16.22 seconds
Similar output not generated. 735.228 Million cell updates/sec

Title: >US-09-121-017B-25
Description: (1-172) from US09121017B.pep
Perfect Score: 1242
Sequence: 1 MSGAGRVQGTQLQALVFLGV.....PRTHYGOKAILFLPLPVSSD 172

Scoring table: PAM 150
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: sptrembl12

1:sp.archaea 2:sp.bacteria 3:sp.fungi 4:sp.human
5:sp.invertebrate 6:sp.mammal 7:sp.mhc 8:sp.organelle
9:sp.phage 10:sp.plant 11:sp.rodent 12:sp.unclassified
13:sp.invertebrate 14:sp.virus

Statistics: Mean 42.894; Variance 68.754; scale 0.624

Pred. No. is the number of results predicted by chance to have a
score greater than or equal to the score of the result being printed,
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.
1	518	41.7	196	4	P78443	21 KD BASIC FIBROBLAST
2	511	41.1	130	6	O77767	BASIC FIBROBLAST GROWT
3	382	30.8	101	13	P79706	BASIC FGF (FRAGMENT)
4	346	27.9	146	13	Q07659	FIBROBLAST GROWTH FACT
5	313	25.2	115	11	Q60487	BASIC FIBROBLAST GROWT
6	301	24.2	194	6	P79150	KERATINOCYTE GROWTH FA
7	289	23.3	212	13	O42407	FIBROBLAST GROWTH FACT
8	274	22.1	252	11	O89096	PHF-48
9	266	21.4	60	4	Q16588	ACIDIC FIBROBLAST GROW
10	265	21.3	59	4	Q16089	ACIDIC FIBROBLAST GROW
11	284	21.3	70	11	O54837	FIBROBLAST GROWTH FACT
12	260	20.9	196	13	O9YH31	POTATIVE FIBROBLAST GR
13	257	20.7	243	13	Q9W6A1	FIBROBLAST GROWTH FACT
14	251	20.2	127	4	O9Y517	FIBROBLAST GROWTH FACT
15	250	20.1	206	13	O9YGD8	FIBROBLAST GROWTH FACT
16	248	20.0	192	4	O9S830	FIBROBLAST GROWTH FACT
17	248	20.0	245	13	Q9W6A2	FIBROBLAST GROWTH FACT
18	236	19.0	200	13	P79925	FIBROBLAST GROWTH FACT
19	226	18.2	425	5	O76831	LET-756 PROTEIN.
20	225	18.1	74	6	O77561	KERATINOCYTE GROWTH FA

21	223	18.0	204	13	Q90696	FIBROBLAST GROWTH FACT	9.35e-27
22	222	17.9	210	13	O57341	FIBROBLAST GROWTH FACT	1.56e-26
23	217	17.5	770	5	P91672	FGF HOMOLOG	1.97e-25
24	213	17.1	244	4	Q14915	FIBROBLAST GROWTH FACT	1.48e-24
25	209	16.8	210	13	O42278	FIBROBLAST GROWTH FACT	1.11e-23
26	207	16.7	129	4	O60371	R33683_2	3.02e-23
27	200	16.1	285	14	Q9YMH2	FIBROBLAST GROWTH FACT	9.91e-22
28	198	15.9	182	14	O92401	FGF-ACHNPV ORF32	2.67e-21
29	190	15.3	114	4	O00527	BASIC FIBROBLAST GROWT	1.37e-19
30	190	15.3	114	4	Q16443	BASIC FIBROBLAST GROWT	1.37e-19
31	187	15.1	216	4	O95750	FGF-19	5.94e-19
32	183	14.7	73	6	O97573	FIBROBLAST GROWTH FACT	4.16e-18
33	157	12.6	78	11	O35340	FIBROBLAST GROWTH FACT	9.32e-13
34	116	9.3	82	6	O62682	FIBROBLAST GROWTH FACT	5.60e-05
35	112	9.0	86	13	P79685	FIBROBLAST GROWTH FACT	2.80e-04
36	110	8.9	822	1	O27154	CONSERVED PROTEIN.	6.20e-04
37	102	8.2	243	14	O73554	HYPOTHETICAL 27.5 KD P	1.36e-02
38	101	8.1	211	1	O9YEE7	211AA LONG HYPOTHETICA	1.99e-02
39	101	8.1	569	5	O25978	MAJOR MEROZOITE SURFAC	1.99e-02
40	101	8.1	569	5	O25983	MAJOR MEROZOITE SURFAC	1.99e-02
41	101	8.1	651	5	O25924	MEROZOITE SURFACE ANTI	1.99e-02
42	101	8.1	1720	5	O25922	PRECURSOR OF THE MAJOR	1.99e-02
43	99	8.0	569	5	O25979	MAJOR MEROZOITE SURFAC	4.19e-02
44	99	8.0	569	5	O25970	MAJOR MEROZOITE SURFAC	4.19e-02
45	99	8.0	569	5	O25977	MAJOR MEROZOITE SURFAC	4.19e-02

ALIGNMENTS

RESULT 1
ID P78443 PRELIMINARY; PRT; 196 AA.
AC P78443;
DT 01-MAY-1997 (Tremblrel. 03, Created)
DT 01-NOV-1997 (Tremblrel. 03, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE 21 KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).
GN FGF2.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RA MEDLINE; 89184522.
RA PRATS H., KACHAD M., PRATS A.C., KLAGSBRUN M., LELIAS J.M.,
RA LIAUZUN P., CHALON P., TAUBER J.P., AMALRIC F., SMITH J.A., CAPUT D.;
RT "High molecular mass forms of basic fibroblast growth factor are
RT initiated by alternative CUG codons."
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
RN [2]
RP SEQUENCE OF 81-168 FROM N.A.
RX MEDLINE; 93038550.
RA WATSON R., ANTHONY F., PICKETT M., LAMBDEN P., MASSON G.M.,
RA THOMAS E.J.;
RT "Reverse transcription with nested polymerase chain reaction shows
RT expression of basic fibroblast growth factor transcripts in human
RT granulosa and cumulus cells from in vitro fertilisation patients."
RL Biochem. Biophys. Res. Commun. 187:1227-1231(1992).
DR EMBL; J04513; AAA52532.1; -
DR EMBL; S47380; AAD13853.1; -
DR HSSP; P09038; 1BFF.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHGFG.
DR PRINTS; PR00263; HBGFEGF.
SQ SEQUENCE 196 AA; 21203 MW; 49B75E39 CRC32;

Query Match 41.7%; Score 518; DB 4; Length 19;

Best Local Similarity 52.1%; Pred. No. 2.61e-97;
Matches 76; Conservative 27; Mismatches 41; Indel: 2; Gaps 1;

Db 53 LPEDGGGAGFPFGKDPKRLYCKNGGFFLRHPDGRVDGVREKSDPHK.LQLAQAEERG 112

QY 26 VPSAGARANGSANYKKPKLLYCSNGHFLRILPDGTVDGTRDSRQHIQ.LQLSAESVGE 85

Db 113 VSIKGVCANRYLAMKEDGRLLASKCVTDECFFERLESNNYTSRKYT--SWYVALKR 170
 QY 86 VYKSTETGYLAMDTDGLYGSQTNEECFLERLEENHNTYISKRAEKNWFVGLKK 145

Db 171 TGOYKLGSKTGPQOKAILFLPMSAKS 196

QY 146 NGSKRGPRTHYGOKAILFLPLPVSS 171

RESULT 2
 ID Q07767 PRELIMINARY: PRT: 130 AA.
 AC Q07767;
 DT 01-NOV-1998 (Tremblrel. 08, Created)
 DT 01-NOV-1998 (Tremblrel. 08, Last sequence update)
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 GN BFGF.
 OS Canis familiaris (Dog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
 Eutheria; Carnivora; Fissipedia; Canidae; Canis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-ADRENAL GLAND;
 RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;
 RT "The role of bFGF in canine Hemangiosarcoma";
 RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.
 DR EMBL; AF060562; AAC35912.1;
 DR HSSP; P09038; 1BFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 FT NON_TER 1
 FT SEQUENCE 130 130
 SQ SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;

Query Match 41.1%; Score 511; DB 6; Length 130;
 Best Local Similarity 55.3%; Pred. No. 1.45e-95;
 Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;
 Db 1 FKDPKLYCKNGFFLIHPDGRVGVREKSDPHVKLQQAERGVSIGVCANRYLAM 60
 QY 40 YKPKLYCKNGFFLIHPDGRVGVREKSDPHVKLQQAERGVSIGVCANRYLAM 99
 Db 61 KEDGRLLASKCVTDECFFERLESNNYTSRKYT--SWYVALKRQYKLGKPGQ 118
 QY 100 DTGLYGSQTNEECFLERLEENHNTYISKRAEKNWFVGLKNGSKRGPRTHYGQ 159
 Db 119 KAILFLPMSAKS 130
 QY 160 KAILFLPLPVSS 171

RESULT 3
 ID P79706 PRELIMINARY: PRT: 101 AA.
 AC P79706;
 DT 01-MAY-1997 (Tremblrel. 03, Created)
 DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
 DE BASIC FGF (FRAGMENT).
 OS Cynops pyrrhogaster (Japanese common newt).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
 Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-EMBRYO;
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
 RA KANEDA T.;
 RT "Serial expression of the genes in a mesodermizing ectoderms of
 early Cynops gastrula";
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.
 DR EMBL; D89443; BAAL3958.1;
 DR HSSP; P09038; 2BFH.
 DR PROSITE; PS00247; HBGF_FGF; 1.

DR PFAM; PF00167; FGF; 1.
 FT NON_TER 1
 FT SEQUENCE 101 101
 SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;
 Query Match 30.8%; Score 382; DB 13; Length 101;
 Best Local Similarity 53.4%; Pred. No. 7.46e-64;
 Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;
 Db 1 PRLYCKNGFFLRINSGKVDGAREKSDSYIKLQQAERGVSIGVCANRYLAMKDD 60
 QY 43 PKLYCSNGGHFLRILPDGTVDGTRSDQHIQLQLSAESVGEVIKSTETGYLAMDTD 102
 Db 61 GRIMALKWITDECFERLESNNYTSRKYSD--WYVALKR 101
 QY 103 GLYGSQTNEECFLERLEENHNTYISKRAEKNWFVGLKK 145

RESULT 4
 ID Q07659 PRELIMINARY: PRT: 146 AA.
 AC Q07659;
 DT 01-NOV-1996 (Tremblrel. 01, Created)
 DT 01-NOV-1996 (Tremblrel. 01, Last sequence update)
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
 DE FIBROBLAST GROWTH FACTOR.
 GN BFGF.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 93246053.
 RA BORJA A.Z., ZELLER R., MEIJERS C.;
 RT "Expression of alternatively spliced bFGF first coding exons and
 RT antisense mRNAs during chicken embryogenesis";
 RL Dev. Biol. 157:110-118(1993).
 RN [2]
 RP SEQUENCE OF 52-85 FROM N.A.
 RX MEDLINE; 90382254.
 RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;
 RT "Fibroblast growth factor during mesoderm induction in the early chick
 RT embryo";
 RL Development 109:387-393(1990).
 DR EMBL; M95706; AAA48616.1;
 DR EMBL; X56804; CAA40139.1;
 DR HSSP; P09038; 2BFH.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILJHBGF.
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 27.9%; Score 346; DB 13; Length 146;
 Best Local Similarity 48.1%; Pred. No. 3.35e-55;
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;
 Db 45 ERVSAMVKLQQAERGVSIGVSNRFLAMKEDGRLLALKCAECCFFERLESNNYN 104
 QY 68 TRSDQHIQLQLSAESVGEVIKSTETGYLAMTDGLYGSQTNEECFLERLEENHYN 127
 Db 105 TYRSRKYSD--WYVALKRQYKPGPKTGPQKAILFLPMSAKS 146
 QY 128 TYISKRAEKNWFVGLKNGSKRGPRTHYGOKAILFLPLPVSS 171

RESULT 5
 ID Q60487 PRELIMINARY: PRT: 115 AA.
 AC Q60487;
 DT 01-NOV-1996 (Tremblrel. 01, Created)
 DT 01-NOV-1996 (Tremblrel. 01, Last sequence update)
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 OS Cavia porcellus (Guinea pig).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.

[1]
RN SEQUENCE FROM N.A.
RP TISSUE=PROSTATE;
RC RICCIARDELLI C.;
RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; L75974; AAA85394.1; -
DR HSSP; P09038; 2BFH.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER
SQ SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match 25.2%; Score 313; DB 11; Length 115;
Best Local Similarity 44.6%; Pred. No. 2,24e-47;
Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;

Db 1 GFRLRHDPGRVDGVEKTDPHIKHFKPKA-EELCYQGSLSNRYLAMKEDGRLLASKCV 59
52 GHFLRLPDGTVGTRDSQHIQLQLSAESVGEVYIKSTETQGYLAMDTDGLLYGSQTP 111

60 TDECFERLESNNYTSRKYS--SWYALKRTQYKLG 98

QY 112 NEECLEFLERLEENHNYTISKHAEKNWFVGLKNGSCRRG 152

RESULT 6
ID P79150 PRELIMINARY; PRT; 194 AA.

AC P79150;
DT 01-MAY-1997 (Tremblrel. 03, Created)
DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE KERATINOCYTE GROWTH FACTOR.
OS Canis familiaris (Dog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
RN [1]
RP SEQUENCE FROM N.A.

RX MEDLINE; 96226403.
RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,
BRUGGEMEIER R.W., LIN Y.C.;
RT "Keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine
prostate: molecular cloning of mRNA encoding canine KGF.";
RL DNA Cell Biol. 15:247-254(1996).
DR EMBL; U08000; AAB38972.1; -
DR HSSP; P05230; 2ARG.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
PRINTS; PR00262; IL1HBGF.
PRINTS; PR00263; HBGF_FGF.
SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match 24.2%; Score 301; DB 6; Length 194;
Best Local Similarity 38.6%; Pred. No. 1.47e-44;
Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;

Db 69 LFCRTQ-WTLRDKRKVGKVGTOEMKSNYMEIRTVAGVIAIKGVSEYIYAMNKEGL 127
QY 46 LYCSNGGHFLRLPDGTVGTRDSQHIQLQLSAESVGEVYIKSTETQGYLAMDTDGLL 105

Db 128 YAKKECNECNEKLELLEHNYTISAKWTHSGEMFVALNOKGVVPVKGKTKKQKTAH 187
QY 106 YGSQTNECLFLERLEENHNYTIS-K-KHAEKNWFVGLKNGSCRRGPRTHYGOKAIL 163

Db 188 FLPMAT 194

QY 164 FLPLPV 170

RESULT 7

ID O42407 PRELIMINARY; PRT; 212 AA.

AC O42407;

DT 01-JAN-1998 (Tremblrel. 05, Created)

DT 01-JUN-1998 (Tremblrel. 06, Last sequence update)

DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)

DE FIBROBLAST GROWTH FACTOR 10.

OS Gallus gallus (Chicken).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;

OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.

RN [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 97330690.

RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,

RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;

RT "The mesenchymal factor, FGF10, initiates and maintains the outgrowth

RT of the chick limb bud through interaction with FGF8, an apical

RT ectodermal factor.";

RL Development 124:2235-2244(1997).

DR EMBL; D86333; BAA24945.1; -

DR HSSP; P03968; 1BAR.

DR PFAM; PF00167; FGF; 1.

DR PRINTS; PR00263; HBGF_FGF.

SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match 23.3%; Score 289; DB 13; Length 212;

Best Local Similarity 39.1%; Pred. No. 9.27e-42;

Matches 52; Conservative 26; Mismatches 51; Indels 4; Gaps 4;

Db 82 RRKRL-Y-SYNKYFLKIEKNGKVGSKCPFSLEITTSVEIGVAVKSKSNYYLAMN 139

QY 41 KPKLLYCSNGGHFLRLPDGTVGTRDSQHIQLQLSAESVGEVYIKSTETQGYLAM 100

Db 140 KKGKYGSKFNSCKLKERIEENGYNTYASLNKMGKRGOMFVALNGRGTAKRGKTRK 199

QY 101 TDGLLYGSQTNECLFLERLEENHNYTIS-K-KHAEKNWFVGLKNGSKCRGPRTHYG 158

Db 200 NTSAHFLPVMVMS 212

QY 159 OKAILFLPLPVSS 171

RESULT 8

ID O89096 PRELIMINARY; PRT; 252 AA.

AC O89096;

DT 01-NOV-1998 (Tremblrel. 08, Created)

DT 01-NOV-1998 (Tremblrel. 08, Last sequence update)

DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)

DE FHF-4B.

OS Rattus norvegicus (Rat), and Mus musculus (Mouse).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.

RN [1]

RP SEQUENCE FROM N.A.

RC TISSUE-BRAIN;

RX MEDLINE; 98267141.

RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;

RT "Structure and expression of a novel isoform of mouse FGF homologous

RT factor (FHF)-4.";

RL Biochim. Biophys. Acta 1398:38-41(1998).

DR EMBL; AB008908; BAA31544.1; -

DR EMBL; AB008907; BAA31543.1; -

DR HSSP; P03968; 1BAR.

DR PROSITE; PS00247; HBGF_FGF; 1.

DR PFAM; PF00167; FGF; 1.

SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match 22.1%; Score 274; DB 11; Length 252;

Best Local Similarity 37.5%; Pred. No. 2.75e-38;

Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;

Db 80 LYCROG-YIOMHPDGLDGTGDKDDSTNLTFLNLPVGLRVVAIQVKTLIYAMNGEYL 138

QY 46 LYCSNGGHFLRLPDGTVGTRDSQHIQLQLSAESVGEVYIKSTETQGYLAMDTDGLL 105

Db 139 YPSELFTECKFKESVFENYVYSSMLYRQOESGRANFLGINKESQVMKGNRVKTKPA 198

```

Query Match      21.3%; Score 265; DB 4; Length 59;
Best Local Similarity 94.6%; Pred. No. 3.21e-36;
Matches        35; Conservative     2; Mismatches    0; Indels   0; Gaps    0;

Db       20 PGNYKPKLLYCSNGGHFLRLPDGTVDGTDRSDQH 56
QY       37 SANYKKPGLLYCSNGGHFLRLPDGTVDGTDRSDQH 73

RESULT 11
ID O54837 PRELIMINARY; PRT; 70 AA.
AC O54837;
DT 01-JUN-1998 (Tremblrel. 06, Created)
DT 01-JUN-1998 (Tremblrel. 06, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RN SEQUENCE FROM N.A.
RC STRAIN=C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DDBJ databases.
DR EMBL; AF012926; AAB94020.1; -
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF_1.
FT NON_TER 70
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;

Query Match      21.3%; Score 264; DB 11; Length 70;
Best Local Similarity 97.2%; Pred. No. 5.44e-36;
Matches        35; Conservative     1; Mismatches    0; Indels   0; Gaps    0;

Db       35 GNYYKPKLLYCSNGGHFLRLPDGTVDGTDRSDQH 70
QY       38 ANYKKPGLLYCSNGGHFLRLPDGTVDGTDRSDQH 73

RESULT 12
ID Q9YH31 PRELIMINARY; PRT; 196 AA.
AC Q9YH31;
DT 01-MAY-1999 (Tremblrel. 10, Created)
DT 01-MAY-1999 (Tremblrel. 10, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.
OS Notophthalmus viridescens (Eastern newt) (Triturus viridescens).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.
[1]
RN SEQUENCE FROM N.A.
RP WEI Y.;
RT "Putative Newt Fibroblast Growth Factor-4.";
RL Submitted (OCT-1996) to the EMBL/GenBank/DDBJ databases.
DR EMBL; U76998; AAC98812.1; --
DR HSSP; P09038; IBFF.
DR PROSITE; PS00247; HBGF_FGF_1.
SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match      20.9%; Score 260; DB 13; Length 196;
Best Local Similarity 34.6%; Pred. No. 4.46e-35;
Matches        44; Conservative    31; Mismatches   48; Indels   4; Gaps   3;

Db       71 KLRRRYCNVGIGFHLQLVPDGRIHGHHSES--RYSLLLEISPVGVCMFGVSGLFLAM 129
QY       41 KKPKLLYCSNGGHF-LRLPDGTVDGTDRSDQHILQLLSAESVEGYIKSTETGGYLAM 99

Db       130 NSKGRLPGSYFSDECKFEKMELPNNNYNAYESWRYPQM--YIALSKNGRAKKGNKVSPTM 187
QY       100 DTDLGGLYSTPTNDECFLERLENHYNTYISKKAHKFNWFGVLKNKSCKGRPRTHYGQ 159

Db       188 TVTHFLP 194
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QY      46 LYCSNGHFRLRLPDCGTVDGTRDRSDQHQLQLSAESVGEVIKSTETGOYLAMDFTDGLL 103
Db      61 YSSDVFTPECKFESFYENYYVVYSTLYRQOESGRFWFLGLNKKEQIMKGNRVKKTKPS 120
       |:| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
QY     106 YGSQTNEECFLERLEENHYNTIISK--KHAE--KNWFVLGLKKNSCRGRPRTHYGOKA 161
Db     121 SHFVPKP 127
       | : | |
QY     162 ILFLPLP 168

RESULT 15
ID Q9YGD8 PRELIMINARY; PRT: 206 AA.
AC Q9YGD8;
DT 01-MAY-1999 (TReMBLrel. 10, Created)
DT 01-NOV-1999 (TReMBLrel. 10, Last sequence update)
DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 6-RELATED PROTEIN.
GN FGF6.
OS Oncorhynchus mykiss (Rainbow trout) (Salmo gairdneri).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Actinopterygii;
OC Neopterygia; Teleostei; Euteleostei; Protacanthopterygii;
OC Salmoniformes; Salmonidae; Oncorhynchus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 99096461.
RA RESCAN P.Y.;
RT "Identification of a fibroblast growth factor 6 (FGF6) gene in a non-mammalian vertebrate: continuous expression of FGF6 accompanies muscle fiber hyperplasia.";
RL Biochim. Biophys. Acta 1443:305-314(1998).
DR EMBL; Y16850; CAA76422.1; -.
DR HSP; P09038; IBFF.
DR DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 206 AA; 23375 MW; 818267C3 CRC32;

Query Match 20.1%; Score 250; DB 13; Length 206;
Best Local Similarity 31.5%; Pred. No. 8,38e-33;
Matches 40; Conservative 36; Mismatches 47; Indels 4; Gaps

Db      81 KVRRLYCNAIGIFHLQVLPDGRRINGVHN--ENQYSILIEISTVERGVVSILYGRSELFVAM 139
       | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
QY     41 KKPRLLYCSNGGHF-LRLIPDGVTDGTRDRSDQHQLQLSAESVGEVIKSI:TETGOYLAM 99
Db     140 NSRGRLYTGVTFHDECKFPRESMLPNNNYAESVY--RCGYALNKHGRLKGKKATTAM 197
       | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
QY     100 DTDGLLYSGSTPNEECLFLERLEENHYNTIISKHAEKNWVFGLKKNSCRGRPRTHYGQ 159
       | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Db     198 TVTHFLP 204
       |||
QY     160 KAILFLP 166

Search completed: Tue Aug 29 16:08:54 2000
Job time : 65 secs.
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(TM)

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MParch_pp      protein - protein database search, using Smith-Waterman algorithm
Run on:        Tue Aug 29 16:13:31 2000;   MasPar time 8.08 Seconds
              615.683 Million cell updates/sec
              Regular output not generated.

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Scoring table: PAM 150
Gap 11

Post-processing: Minimum Match 0%
Listing first 45 summaries

Statistics: Mean 32.362; Variance 134.055; scale 0.241

SUMMARIES

Result No.	Query Match	Score	ID	Description	Pred. No.
1	64.7	984	1 R25914	Human acidic fibroblasts	5 88e-86
2	64.7	984	1 R34497	Human acidic fibroblasts	5 88e-86
3	64.7	984	1 P30068	Human acid fibroblast	5 88e-86
4	64.7	984	1 R74647	Human recombinant aFGF	5 88e-86
5	64.7	984	1 W04806	Human acidic fibroblasts	5 88e-86
6	64.7	984	1 P70995	Sequence of human prot	5 88e-86
7	64.7	984	1 R10537	Human acidic fibroblasts	5 88e-86
8	64.7	984	1 R05789	Human aFGF encoded by	5 88e-86
9	64.7	984	1 W32283	Human beta-endothelial	5 88e-86
10	64.7	984	1 W04805	Human beta-endothelial	5 88e-86
11	64.7	984	1 W06816	Human endothelial cell	5 88e-86
12	64.7	984	1 W75414	Human beta-endothelial	5 88e-86
13	64.7	984	1 P94037	Human acidic fibroblasts	5 88e-86
14	64.7	984	1 F07812	FGF-1.	5 88e-86
15	64.7	984	1 P70482	Sequence encoded by co	5 88e-86
16	64.7	984	1 R80776	Fibroblast growth fact	5 88e-86
17	64.7	984	1 W53022	Fibroblast growth fact	5 88e-86
18	64.7	984	1 W75711	Fibroblast growth fact	5 88e-86
19	64.7	984	1 W75415	Human endothelial cell	5 88e-86
20	64.7	984	1 W32291	Human endothelial cell	5 88e-86
21	64.7	984	1 R05785	Human bECGF encoded by	5 88e-86
22	64.7	984	1 W06818	Human endothelial cell	5 88e-86
23	64.6	983	1 W75413	Human alpha-endothelial	7.43e-86

QY 196 GOKAILFLPLPVSSD 210

RESULT 2

ID R34497; standard; protein; 140 AA.

AC R34497;

DT 06-AUG-1993 (first entry)

DE Human acidic fibroblast Growth Factor.

KW aFGF; mutain; glycosylation site; glycoprotein.

OS Homo sapiens.

PN J05076356-A.

PD 30-MAY-1991; 127435.

PF 31-MAY-1990; JP-143388.

PR (TAKE) TAKEDA CHEM IND LTD.

PA WPI; 93-139564/17.

DR FGF mutin prepn. useful for therapy of burn or thrombosis - by

PT transformation of lymphocyte-contained animal cell by vector

TS contg. DNA encoding FGF mutin

TI Disclosure; Page 3; 23pp; Japanese.

CC The invention covers mutins of FGF (esp. bFGF) which contain at

CC least one glycosylation site. The mutins can be used to treat burns

CC and thrombosis.

SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65

QY :|||||

QY 76 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 135

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 125

QY :|||||

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 195

Db 126 GOKAILFLPLPVSSD 140

QY :|||||

QY 196 GOKAILFLPLPVSSD 210

Db 126 GOKAILFLPLPVSSD 140

QY :|||||

RESULT 3

ID P90068; standard; protein; 140 AA.

AC P90068;

DT 1-NOV-1989 (first entry)

DE Human acid fibroblast growth factor

KW Human acid fibroblast growth factor; mutant.

OS Homo sapiens

PN EP-319052-A.

PD 14-JUN-1989.

PF 14-OCT-1988; 202306.

PR 22-OCT-1987; EP-244431.

PA (MERI) Merck and Co.

PI Thomas Jnr KA, Linemeyer DL;

DR WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor

PT - used for promoting repair of soft tissue, musculoskeletal

PT tissue or vascular or nerve tissue and plasminogen

PS activator prodn.

TS Disclosure; page 4; 36pp; English.

CC Amino acid sequence of human acidic fibroblast growth

CC factor (aFGF). The patent claims mutant forms which have

CC increased biological activity with(out) heparin, and promote

CC cell growth.

SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65

QY :|||||

QY 76 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 135

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 125

QY :|||||

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 195

Db 126 GOKAILFLPLPVSSD 140

QY :|||||

QY 196 GOKAILFLPLPVSSD 210

Db 126 GOKAILFLPLPVSSD 140

QY :|||||

RESULT 4

ID R74647; standard; protein; 140 AA.

AC R74647;

DT 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis;

KW mitogen.

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PF 24-DEC-1984; 685923.

PR 24-DEC-1984; US-685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1988; US-190293.

PR 08-FEB-1991; US-654397.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

DR WPI; 95-138983/18.

PT New recombinant human acidic fibroblast growth factor - used to

PT promote cell growth, to promote wound healing, for vascular

PT grafts and blood vessel repair

PS Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid

CC sequence of bovine acidic fibroblast growth factor (aFGF) and

CC used to produce a synthetic gene (given in Q88233) incorporating

CC codons preferred by E. coli or mammalian cells, unique cloning

CC sites, etc. This synthetic gene was mutagenized to obtain a gene

CC encoding a human recombinant aFGF (R74647) having activity

CC equivalent to the native protein.

SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65

QY :|||||

QY 76 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 135

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 125

QY :|||||

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGRPTHY 195

Db 126 GOKAILFLPLPVSSD 140

QY :|||||

QY 196 GOKAILFLPLPVSSD 210

Db 126 GOKAILFLPLPVSSD 140

QY :|||||

RESULT 5

ID W04806; standard; protein; 140 AA.

AC W04806;

DT 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;

KW Heparin-Sepharose affinity chromatography; probe; oligonucleotide;

KW FGF; fibroblast growth factor; ss.

OS Homo sapiens.

PN US552528-A.
 PD 03-SEP-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PA (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Maciag T;
 DR WPI: 96-412132/41.
 DR N-PSDB; T37503.
 PT Isolated, purified, biologically active bovine beta endothelial cell
 PT growth factor - useful to regenerate or treat damaged blood vessels
 PS Disclosure; Fig 8; 28pp; English.
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
 CC a mol. wt. of 20 kD can be purified at least 16300 fold from bovine
 CC brain using heparin-Sepharose affinity chromatography. ECGF is
 CC useful for, among other purposes, diagnostic applications and has
 CC potential in the treatment of damaged blood vessels or other
 CC endothelial cell-lined structures.
 CC Human ECGF (T37503) or fragments may be obtained using
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
 CC on the sequence of bovine alpha- and beta-ECGF.
 SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;
 Best Local Similarity 99.3%; Pred. No. 5.88e-86;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 65
 :|||||
 QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 135
 :|||||
 Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 125
 :|||||
 QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 195
 :|||||
 Db 126 GOKAILFLPLPVSSD 140
 :|||||
 QY 196 GOKAILFLPLPVSSD 210
 :|||||

RESULT 6
 ID P70995 standard; protein; 140 AA.
 AC P70995;
 DT 13-JUN-1991 (first entry)
 DE Sequence of human proteinaceous factor (PFI) with mitogenic activity.
 CC Cell growth promoter; mitogen; vascularisation; wound healing.
 CC Homo sapiens.
 FH Key Location/Qualifiers
 FT misc_difference 140
 FT /label= Asp-OH
 PN EP-241136-A.
 PD 14-OCT-1987.
 PF 06-MAR-1987; 301969.
 PR 07-MAR-1986; US-838096.
 PA (HARD) HARVARD COLLEGE.
 PI Lobb RR, Harper JW, Strydom DJ;
 DR WPI: 87-285995/41.
 PT Mitogenic polypeptide isolated from human brain tissue - useful
 PT for increasing vascular effect in eg wound healing, or
 PT generating endothelial cell linings for vascular prostheses, etc.
 PS Claim 3; Page 1; 31pp; English.
 CC The PF of the invention was obtd. from human brain tissue. It has a
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
 CC affinity for heparin. PFI and fragments are useful for promoting the
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
 CC generating endothelial cell linings for vascular prostheses (all
 CC claimed). The polypeptides are useful for increasing vascularisation.
 SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
 Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 65
 :|||||
 QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 135
 :|||||
 Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 125
 :|||||
 QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 195
 :|||||
 Db 126 GOKAILFLPLPVSSD 140
 :|||||
 QY 196 GOKAILFLPLPVSSD 210
 :|||||

RESULT 7
 ID R10527 standard; Protein; 141 AA.
 AC R10527;
 DT 15-APR-1991 (first entry)
 DE Human acidic fibroblast growth factor gene.
 KW aFGF; antibody; antigen; cancer; ss.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT region 2..12
 FT /label= A
 FT region 56..67
 FT /label= B
 FT region 104..114
 FT /label= C
 FT region 132..141
 FT /label= D
 PN J02306996-A.
 PD 20-DEC-1990.
 PF 03-JUL-1989; 172542.
 PR 04-JUL-1988; JP-166275.
 PR 03-JUL-1989; JP-172542.
 PA (TAKE) TAKEDA CHEMICAL IND KK.
 DR WPI: 91-040150/06.
 DR N-PSDB; Q10399;
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by
 PT using complex of partial peptide(s) of acid fibroblast growth
 PT factor and protein as antigen.
 PS Disclosure; Fig 1; 19pp; Japanese.
 CC The was deduced from a gene used to produce recombinant aFGF.
 CC Peptides derived from the protein, esp. from A-D can be used to as
 CC antigens to produce anti-aFGF antibodies. The peptides must
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,
 CC and for purifying aFGF. They are useful as reagents in the diag-
 CC nosis of various cancers or diseases of the CNS. Purified aFGF
 CC has wound healing and nerve cell proliferating properties.
 SQ Sequence 141 AA;

Query Match 64.7%; Score 984; DB 1; Length 141;
 Best Local Similarity 99.3%; Pred. No. 5.88e-86;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
 Db 7 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 66
 :|||||
 QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 135
 :|||||
 Db 67 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 126
 :|||||
 QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 195
 :|||||
 Db 127 GOKAILFLPLPVSSD 141
 :|||||
 QY 196 GOKAILFLPLPVSSD 210
 :|||||

RESULT 8

IO5789 standard; Protein; 151 AA.
AC R25789;
DT 22-AUG-1990 (first entry)
DE Human aFGF encoded by synthetic gene.
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;
KW atherosclerosis; tumors.
OS Synthetic.
FH Key Location/Qualifiers
FT misc_difference 146..147
FT /note= "sites corresp. to two stop codons of
FT the DNA sequence"
FT
PD GB223496-A.
PN 11-APR-1990.
PP 08-AUG-1988; 018775.
PP 08-AUG-1988; GB-018775.
PA (BRI-) Brit Bio-Tech Ltd.
PI Davies JA, Johnson ID;
FI WPI; 90-109882/15.
DR N-PSDB; Q03873.
RR Gene encoding human acidic fibroblast growth factor -
RR incorporates useful restriction sites at frequent intervals to
RR facilitate cassette mutagenesis of specified regions.
PS Claim 2; Fig 3a; 12pp; English.
CC The synthetic aFGF gene incorporates useful restriction sites at
CC frequent intervals to facilitate the cassette mutagenesis of
CC selected regions. Also included are flanking sites to simplify
CC the incorporation of the gene into any expression system.
CC The aFGF mol. acts in a cascade effect to control endothelial cell
CC activity either co-ordinately through synergistic effects or via
CC independent routes. The regulation of endothelial cells is essential
CC for the protection of arteries, veins and capillaries from the effect
CC of thrombogenesis. Their stimulation and control by these factors is
CC also thought to be important in the development of tumours and
CC atherosclerosis.
SQ Sequence 151 AA;

Query Match 64.7%; Score 984; DB 1; Length 151;
Best Local Similarity 99.3%; Pred. No. 5.88e-86;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 11 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGTQYL 70
QY :|||||
76 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGTQYL 135
Db 71 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKCRGRPTHY 130
QY :|||||
136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKCRGRPTHY 195
Db 131 GKAILFLPLPVSSD 145
QY :|||||
196 GKAILFLPLPVSSD 210

RESULT 9
ID W92283 standard; protein; 154 AA.
AC W92283;
DT 20-APR-1999 (first entry)
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
KW regenerate; blood vessel; endothelial cell; human.
OS Homo sapiens.
PN US5849538-A.
PD 15-DEC-1998.
PP 11-APR-1997; 840088.
PP 04-NOV-1996; US-743261.
PP 03-MAR-1986; US-835594.
PP 18-DEC-1987; US-134499.
PP 29-APR-1991; US-693079.
PP 27-NOV-1991; US-799859.
PP 03-NOV-1994; US-334884.
PP 07-JUN-1995; US-472964.
PP 11-APR-1997; US-840088.
PA (RHON) RHONE-POULENC RORER PHARM INC.

Query Match 64.7%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 5.88e-86;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGTQYL 79
QY :|||||
76 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGTQYL 135
Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKCRGRPTHY 139
QY :|||||
136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKCRGRPTHY 195
Db 140 GKAILFLPLPVSSD 154
QY :|||||
196 GKAILFLPLPVSSD 210

RESULT 10
ID W04805 standard; Protein; 154 AA.
AC W04805;
DT 29-DEC-1996 (first entry)
DE Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PP 03-MAR-1986; 835594.
PP 03-MAR-1986; US-835594.
PP 18-DEC-1987; US-134499.
PP 29-APR-1991; US-693079.
PP 27-NOV-1991; US-799859.
PP 03-NOV-1994; US-334884.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI; 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PS Disclosure; Fig 8; 28pp; English.
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 154 AA;

Query Match 64.7%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 5.88e-86;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGTQYL 79
QY :|||||

QY 76 ANYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 135
Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 139
QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 195
Db 140 GOKAILFLPLPVSSD 154
QY 196 GOKAILFLPLPVSSD 210

RESULT 11

ID W06816 standard; Protein; 154 AA.
AC W06816;
DT 17-MAR-1997 (first entry)
DE Human endothelial cell growth factor-beta.
KW Human endothelial cell growth factor-beta; ECGF-beta.
OS Homo sapiens.
PN US5571790-A.
DB 05-NOV-1996.
QY 03-MAR-1986; 835594.
Db 03-MAR-1986; US-835594.
QY 18-DEC-1987; US-134499.
Db 29-APR-1991; US-693079.
QY 27-NOV-1991; US-799859.
Db 03-NOV-1994; US-334884.
QY 07-JUN-1995; US-472964.
Db (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, Maciag T;
DR WPI; 96-505421/50.
QY N-PSDB; T45983.
Db Recombinant human endothelial cell growth factors - for treating
PT damaged blood vessels, etc.
PS Claim 1; Column 16; 22pp; English.
CC Human recombinant endothelial cell growth factors (ECGF) beta
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
CC They can be produced in transformed prokaryotic or eukaryotic host
CC cells using DNA sequences (T45983 and T45984, respectively) derived
CC from the complete human ECGF cDNA (T45985). Large quantities of
CC the ECGFs are produced by culturing the host cells and recovering
CC the proteins. ECGFs have utility in the growth and amplification
CC of endothelial cells in culture. They can potentially be used to
CC treat damaged blood vessels and other endothelial cell-lined
CC structures, and also have diagnostic applns.
SQ Sequence 154 AA;

Query Match 64.7%; Score 984; DB 1; Length 154;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

QY 20 GNYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 79
Db 76 ANYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 135
QY 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 139
QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 195
Db 140 GOKAILFLPLPVSSD 154
QY 196 GOKAILFLPLPVSSD 210

RESULT 12

ID W75414 standard; Protein; 154 AA.
AC W75414;
DT 02-MAR-1999 (first entry)
DE Human beta-endothelial cell growth factor.
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
KW hybridisation; bovine; wound healing; prosthetic device.
OS Homo sapiens.
PN US3827826-A.
PD 27-OCT-1998.

PF 04-NOV-1996; 743261.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, Maciag T;
DR WPI; 98-594032/50.
PT Compositions for promoting wound healing - containing endothelial
PT cell growth factor polypeptides
PS Claim 1; Column 16; 23pp; English.
CC This sequence represents the amino acid sequence of the mature human
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
CC is identical to the alpha-ECGF but the beta sequence contains an extra
CC 20 N-terminal amino acids. The sequence was isolated from a human brain
CC stem cell cDNA library using a probe designed based on fragments of the
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
CC compositions for promoting wound healing. ECGF is also used to grow
CC cells on a prosthetic device.
SQ Sequence 154 AA;

Query Match 64.7%; Score 984; DB 1; Length 154;
Best Local Similarity 99.3%; Pred. No. 5.88e-86;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 79
QY 76 ANYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 135
Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 139
QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 195
Db 140 GOKAILFLPLPVSSD 154
QY 196 GOKAILFLPLPVSSD 210

RESULT 13

ID P94037 standard; Protein; 155 AA.
AC P94037;
DT 25-JUN-1990 (first entry)
DE Human acidic fibroblast growth factor.
KW Acidic fibroblast growth factor.
OS Homo sapiens.
PN EP-298723-A.
PD 11-JAN-1989.
PF 06-JUL-1988; 306158.
PR 07-JUL-1987; US-070797.
PA (BIOT-) Biotechn Res Assoc.
PI Fiddes JC, Abraham JA, Protter A;
DR WPI; 89-009785/02.
DR N-PSDB; N93088.
PT Recombinant DNA encoding new fibroblast growth factor
PT analogues - useful eg for accelerating wound healing and
PT to control neovascularisation.
PS Disclosure; p; English.
CC See also P94038.
SQ Sequence 155 AA;

Query Match 64.7%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 5.88e-86;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 80
QY 76 ANYKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 135
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWNFVGLKNGSKCKRGPRTHY 140

QY 136 AMDTGLLYGSTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195
 Db 141 GOKAILFLPLPVSSD 155
 QY 196 GOKAILFLPLPVSSD 210

RESULT 14

ID R70812 standard; protein; 155 AA.
 AC R70812; 141 GOKAILFLPLPVSSD 155
 DT 01-SEP-1995 (first entry)
 DE FGF-1.
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT misc_difference 31 /note= "Cys may be replaced by Ser"
 FT misc_difference 132 /note= "Cys may be replaced by Ser"
 W09503831-A.
 PD 09-FEB-1995.
 PF 27-JUL-1994; U08511.
 PR 02-AUG-1993; US-099924.
 PR 29-OCT-1993; US-145829.
 PA (PRIZ-) PRIZM PHARM INC.
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
 PI Baird AJ, Lappi DA, Sosnowski BA;
 DR WPI; 95-082038/11.
 PT New monogenous preparations of cytotoxic conjugates and DNA
 PT contain fibroblast growth factors and cytotoxic agents for
 PT treating FGF conditions such as tumours, diabetes and rheumatoid
 PT arthritis.
 PS Disclosure; Page 108-109; 128pp; English.
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70814) or
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
 CC by conservative Ser substitutions. The fusion proteins are potent
 CC cytotoxic agents to cells bearing the FGF receptor.
 SQ Sequence 155 AA;

Query Match 64.7%; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 5.88e-86;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 80
 :|||||
 76 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 135
 :|||||
 81 AMDTGLLYGSTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSCKRGPRTHY 140
 :|||||
 QY 136 AMDTGLLYGSTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195
 :|||||
 Db 141 GOKAILFLPLPVSSD 155
 :|||||
 QY 196 GOKAILFLPLPVSSD 210

RESULT 15

ID P70482 standard; Protein; 155 AA.
 AC P70482;
 DT 13-MAY-1991 (first entry)
 DE Sequence encoded by complete cDNA sequence of human endothelial
 DE cell growth factor (ECGF).
 KW Endothelial cell regeneration; blood vessel regeneration.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT protein 2..15
 FT protein /label= Beta ECGF
 FT protein 16..21
 FT protein /label= Acidic FGF
 FT protein 22..155
 FT protein /label= Alpha ECGF

PN W08705332-A.
 PD 11-SEP-1987.
 PF 02-MAR-1987; U00425.
 PR 03-MAR-1986; US-835594.
 PR 26-MAR-1987; ES-000812.
 PA (MELO-) MELOY LAB INC.
 PA (RORE-) RORER BIOTECHN INC.
 PA (RORE-) RORER.
 PA BIOTECH INC.
 PI Jaye M, Burgess W, Maciag T, Drohan W;
 DR WPI; 87-264128/37.
 DR N-PSDB; N70788
 PT Human endothelial cell growth factor - produced by recombinant
 PT DNA techniques, useful for wound healing
 PS Example; Fig 8; 43pp; English.
 CC To screen the human brain stem cDNA library for clones contg. ECGF
 CC inserts, a specific oligonucleotide was designed. This
 CC oligonucleotide was based upon a partial AA sequence analysis of
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
 CC forth for comparison the AA sequence of cyanogen bromide-cleaved
 CC bovine alpha and beta ECGF (P70834). The two clones that were
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
 CC nucleotide sequence of these clones and the AA sequence deduced from
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
 SQ Sequence 155 AA;

Query Match 64.7%; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 5.88e-86;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 80
 :|||||
 QY 76 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOYL 135
 :|||||
 Db 81 AMDTGLLYGSTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSCKRGPRTHY 140
 :|||||
 QY 136 AMDTGLLYGSTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195
 :|||||
 Db 141 GOKAILFLPLPVSSD 155
 :|||||
 QY 196 GOKAILFLPLPVSSD 210

Search completed: Tue Aug 29 16:13:57 2000
 Job time : 26 secs.

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(TM)

Title: >US-09-121-017B-27
Description: (1-210)-from-0809121017B.ppe
Perfect Score: 1522
Sequence: 1 MSKGRVQGTQLQALVFLGV.....PRHYGQKAILFLPLPVSSD 210
Scoring table: PAM 150
Gap 11
Searched: 142080 seqs, 47172406 residues
Post-processing: Minimum Match 0%
Listing first 45 summaries
Database: pir64
1:pir1 2:pir2 3:pir3 4:pir4
Statistics: Mean 44.620; Variance 79.868; scale 0.559
Pred. No. is the number of results predicted by chance to have a
score greater than or equal to the score of the result being printed,
and is derived by analysis of the total score distribution.

SUMMARIES
Result No. Score Match Length DB ID Description Pred. No.
1 984 64.7 155 1 A33665 acidic fibroblast gro 2.00e-192
2 967 63.5 155 1 A60721 acidic fibroblast gro 1.76e-188
3 966 63.5 155 2 D37360 acidic fibroblast gro 3.00e-188
4 966 63.5 155 2 S04147 acidic fibroblast gro 3.00e-188
5 953 62.6 152 2 JH0476 acidic fibroblast gro 3.09e-185
6 917 60.2 155 1 GRBOA acidic fibroblast gro 6.69e-177
7 916 60.2 155 2 A60130 acidic fibroblast gro 1.14e-176
8 906 59.5 155 2 JH0055 fibroblast growth fac 2.34e-174
9 702 46.1 208 2 S14192 fibroblast growth fac 1.66e-127
10 681 44.7 208 2 S20102 fibroblast growth fac 1.00e-122
11 522 34.3 189 2 A48834 basic fibroblast gro 6.67e-87
12 516 33.9 146 1 S00185 basic fibroblast gro 1.45e-85
13 516 33.9 157 1 GRBOB basic fibroblast gro 1.45e-85
14 508 33.4 154 2 C37360 basic fibroblast gro 8.70e-84
15 508 33.4 154 2 A31674 basic fibroblast gro 8.70e-84
16 509 33.4 210 2 A32398 basic fibroblast gro 5.21e-84
17 498 32.7 164 2 S16222 basic fibroblast gro 1.44e-81
18 489 32.1 155 1 A40117 basic fibroblast gro 1.43e-79
19 466 30.6 137 2 I46711 fibroblast growth fac 1.72e-74
20 376 24.7 192 2 S54407 embryonic fibroblast 7.13e-55
21 350 23.0 208 2 S66486 fibroblast growth fac 2.64e-49
22 350 23.0 208 2 A48137 fibroblast growth fac 2.64e-49
23 341 22.4 187 2 S23595 embryonic fibroblast 2.17e-47

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7 916 60.2 155 2 A60130 acidic fibroblast gro 1.14e-176
8 906 59.5 155 2 JH0055 fibroblast growth fac 2.34e-174
9 702 46.1 208 2 S14192 fibroblast growth fac 1.66e-127
10 681 44.7 208 2 S20102 fibroblast growth fac 1.00e-122
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13 516 33.9 157 1 GRBOB basic fibroblast gro 1.45e-85
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15 508 33.4 154 2 A31674 basic fibroblast gro 8.70e-84
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17 498 32.7 164 2 S16222 basic fibroblast gro 1.44e-81
18 489 32.1 155 1 A40117 basic fibroblast gro 1.43e-79
19 466 30.6 137 2 I46711 fibroblast growth fac 1.72e-74
20 376 24.7 192 2 S54407 embryonic fibroblast 7.13e-55
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22 350 23.0 208 2 A48137 fibroblast growth fac 2.64e-49
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15 508 33.4 154 2 A31674 basic fibroblast gro 8.70e-84
16 509 33.4 210 2 A32398 basic fibroblast gro 5.21e-84
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18 489 32.1 155 1 A40117 basic fibroblast gro 1.43e-79
19 466 30.6 137 2 I46711 fibroblast growth fac 1.72e-74
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Gap 11
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Database: pir64
1:pir1 2:pir2 3:pir3 4:pir4
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Pred. No. is the number of results predicted by chance to have a
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4 966 63.5 155 2 S04147 acidic fibroblast gro 3.00e-188
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6 917 60.2 155 1 GRBOA acidic fibroblast gro 6.69e-177
7 916 60.2 155 2 A60130 acidic fibroblast gro 1.14e-176
8 906 59.5 155 2 JH0055 fibroblast growth fac 2.34e-174
9 702 46.1 208 2 S14192 fibroblast growth fac 1.66e-127
10 681 44.7 208 2 S20102 fibroblast growth fac 1.00e-122
11 522 34.3 189 2 A48834 basic fibroblast gro 6.67e-87
12 516 33.9 146 1 S00185 basic fibroblast gro 1.45e-85
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14 508 33.4 154 2 C37360 basic fibroblast gro 8.70e-84
15 508 33.4 154 2 A31674 basic fibroblast gro 8.70e-84
16 509 33.4 210 2 A32398 basic fibroblast gro 5.21e-84
17 498 32.7 164 2 S16222 basic fibroblast gro 1.44e-81
18 489 32.1 155 1 A40117 basic fibroblast gro 1.43e-79
19 466 30.6 137 2 I46711 fibroblast growth fac 1.72e-74
20 376 24.7 192 2 S54407 embryonic fibroblast 7.13e-55
21 350 23.0 208 2 S66486 fibroblast growth fac 2.64e-49
22 350 23.0 208 2 A48137 fibroblast growth fac 2.64e-49
23 341 22.4 187 2 S23595 embryonic fibroblast 2.17e-47

24 329 21.6 207 2 JC5941 fibroblast growth fac 7.53e-45
25 324 21.3 207 2 JC5940 fibroblast growth fac 8.55e-44
26 310 20.4 194 2 JC5940 fibroblast growth fac 7.46e-41
27 304 20.0 206 2 JC4268 HST protein - bovine 1.34e-39
28 302 19.8 194 2 S49501 keratinocyte growth f 3.50e-39
29 299 19.6 194 1 A36301 fibroblast growth fac 1.47e-38
30 295 19.4 194 2 I48610 keratinocyte growth f 1.00e-37
31 293 19.3 194 2 S26049 fibroblast growth fac 2.60e-37
32 279 18.3 264 2 A36207 transforming protein 2.03e-34
33 277 18.2 266 2 S68144 fibroblast growth fac 5.22e-34
34 272 17.9 206 1 TVH0HS fibroblast growth fac 5.54e-33
35 269 17.7 267 1 TVH0F5 transforming protein 2.27e-32
36 266 17.5 256 2 JC4627 fibroblast growth fac 9.31e-32
37 265 17.4 60 2 JH0708 fibroblast growth fac 1.49e-31
38 257 16.9 168 2 JG0184 fibroblast growth fac 6.28e-30
39 256 16.8 202 1 TVMSHS transforming protein 1.00e-29
40 250 16.4 220 2 I50588 FGF-3 - chicken 1.63e-28
41 236 15.5 125 2 A32484 basic fibroblast grow 1.03e-25
42 236 15.5 237 1 S39582 transforming protein 1.03e-25
43 234 15.4 97 2 B46289 keratinocyte growth f 2.58e-25
44 233 15.3 245 1 TVMST2 transforming protein 4.08e-25
45 229 15.0 239 1 S04742 fibroblast growth fac 2.53e-24

ALIGNMENTS

RESULT 1
ENTRY A33665 #type complete
TITLE acidic fibroblast growth factor 1 precursor - human
ALTERNATE_NAMES beta-ECGF; endothelial cell growth factor beta;
heparin-binding growth factor 1
ORGANISM #formal_name Homo sapiens #common_name man
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A33665; A32316; S18217; A43804; A24662; JH0707; S35535;
S35536; I39413; A23553; A24820; A24243; A24301; A26386;
A53639
REFERENCE A33665
#authors Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.;
Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes,
J.C.
#journal Biochem. Biophys. Res. Commun. (1989) 164:1121-1129
#title Structural analysis of the gene for human acidic fibroblast
growth factor
#cross-references MUID:90073637
#accession A33665
#molecule_type DNA
#residues 1-155 #label MER
#cross-references GB:M30491
REFERENCE A32316
#authors Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu,
I.M.
#journal Mol. Cell. Biol. (1989) 9:2387-2395
#title Cloning of the gene coding for human class 1 heparin-binding
growth factor and its expression in fetal tissues.
#cross-references MUID:89343957
#accession A32316
#molecule_type DNA
#residues 1-155 #label WAN
#cross-references GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768
REFERENCE S18217
#authors Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needelman, S.W.;
Chiu, I.M.
#journal Oncogene (1991) 6:1521-1529
#title Cloning and sequence analysis of the human acidic fibroblast
growth factor gene and its preservation in leukemia
patients.
#cross-references MUID:92019819
#accession S1217
#molecule_type DNA
#residues 1-155 #label WA2
#cross-references EMBL:M23086
REFERENCE A43804

#authors Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal Oncogene (1990) 5:755-762
#title Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession A43804
##molecule_type mRNA
##residues 1-155 ##label CHI
##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32435
REFERENCE A24662
#authors Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.; Raveria, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.; Drohan, W.N.
#journal Science (1986) 233:541-545
#title Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.
#cross-references MUID:86261805
#accession A24662
##molecule_type mRNA
##residues 1-155 ##label JAY
##cross-references GB:M1361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE JH0707
#authors Yu, Y.L.; Kha, H.; Golden, J.A.; Magchielsen, A.A.J.; Goetzl E.J.; Turck, C.W.
#journal J. Exp. Med. (1992) 175:1073-1080
#title An acidic fibroblast growth factor protein generated by alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession JH0707
##molecule_type mRNA
##residues 1-155 ##label YUY
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE S35535
#authors Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris S.E.; Myers, R.L.; Chiu, I.M.
#journal Nucleic Acids Res. (1993) 21:489-495
#title Cloning of two novel forms of human acidic fibroblast growth factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession S35535
##status translation not shown
##molecule_type mRNA
##residues 1-58 ##label PAY
##cross-references GB:L01485
#accession S35536
##status translation not shown
##molecule_type mRNA
##residues 1-58 ##label PA2
##cross-references GB:L01487
REFERENCE I39412
#authors Crumley, G.; Dionne, C.A.; Jaye, M.
#journal Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title The gene for human acidic fibroblast growth factor encodes two upstream exons alternatively spliced to the first coding exon.
#cross-references MUID:90365758
#accession I39413
##status translation not shown
##molecule_type mRNA
##residues 1-40 ##label RES
##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170
REFERENCE A23553
#authors Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession A23553
##molecule_type protein
##residues 16-155 ##label HAR
REFERENCE A24820
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title The complete amino acid sequence of human brain-derived

```
Db 141 GOKAILFLPLPVSSD 155
|||||
QY 196 GOKAILFLPLPVSSD 210

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-1 gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721 not compared with conceptual translation
#status
##molecule_type DNA
##residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 63.5%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 1.76e-188;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
:|||||
QY 76 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 135
|||||

Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 140
|||||
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 195
|||||

Db 141 GOKAILFLPLPVSSD 155
|||||
QY 196 GOKAILFLPLPVSSD 210

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE D37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
##molecule_type mRNA
##residues 1-155 #label HEB
##cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
```

```
##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
disease including atherosclerosis, cancer and inflammatory
autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 63.5%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.00e-188;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
:|||||
QY 76 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 135
|||||

Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 140
|||||
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 195
|||||

Db 141 GOKAILFLPLPVSSD 155
|||||
QY 196 GOKAILFLPLPVSSD 210

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 63.5%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.00e-188;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
:|||||
QY 76 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 135
|||||

Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 140
|||||
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 195
|||||

Db 141 GOKAILFLPLPVSSD 155
|||||
QY 196 GOKAILFLPLPVSSD 210

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
```

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#molecule_type fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
##cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
##experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
PRIMARY #length 152 #checksum 1124
Query Match 62.6%; Score 953; DB 2; Length 152;
Best Local Similarity 97.0%; Pred. No. 3.09e-185;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGHFLRILPDGTVDRSDHQLQLSAESVGEVIKSTGTQYL 80
:|||||
QY 76 ANYKKPKLLYCSNGHFLRILPDGTVDRSDHQLQLSAESVGEVIKSTGTQYL 135
|||||
Db 81 AMDTGSLYSGTSPSECLFLERLEENHYTYTSKKHAENWFVGLKKNKSGCRGRPTHY 140
|||||
QY 136 AMDTGSLYSGTSPSECLFLERLEENHYTYTSKKHAENWFVGLKKNKSGCRGRPTHY 195
|||||
Db 141 GQRAILFLPLPV 152
|||||
QY 196 GQRAILFLPLPV 207
|||||

RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatropin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
ACCESSIONS JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
JH0613
REFERENCE Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts.
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
##cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE A94281
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; Disalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologues.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Armes, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatropin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine
heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24;121-127;134-143 ##label SAS
##experimental_source heart
COMMENT
The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT
This protein binds heparin, although less strongly than does bFGF
COMMENT
There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the p
...
Note: remainder of annotations omitted.
Query Match 60.2%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 6.69e-177;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0
Db 21 GNYKKPLLKLYCSNGGYFLRLPPGTVDGTRKDSQHQIQLCAESIGEVYIKSTGTQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 76 ANYKPKLLKLYCSNGGHFLRLPPGTVDGTRKDSQHQIQLCAESVGEYIKSTGTQYL 135
Db 81 AMDTDGLLYGSOTNEECFLERLEENHNNTYISKKHAEKHWFGVLKNGRSKLGPRTFH 140
|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 136 AMDTDGLLYGSOTNEECFLERLEENHNNTYISKKHAEKHWFGVLKNGRSKRGPRTHY 195
Db 141 GQKAILFLPLPVSSD 155
|||||:|||||:
QY 196 GQKAILFLPLPVSSD 210
RESULT 7
ENTRY #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSION A60130
REFERENCE A60130; S02639
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 ##label SCH
##cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234377
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1986) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblas' growth factor
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30,'X',32-44,'X',46-48 ##label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY          #length 155 #molecular-weight 17322 #checksum 7617
Query Match      60.2%; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 1.14e-176;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHEFLRILPDGKVDGTRDSDQHIQLQLSAEDVGEVIKSTETGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 76 ANYKKPKLLYCSNGGHEFLRILPDGTVDTGTRDSDQHIQLQLSAESVGEVIKSTETGQYL 135
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEENHYNTYISKHADKNWFVGLKKNKSGKLGPRTHY 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 136 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFVGLKKNKSGCKRGPRTHY 195
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 196 GOKAILFLPLPVSSD 210
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY fibroblast growth factor-1 - sheep
TITLE FGF-1
ALTERNATE_NAMES
ORGANISM
DATE #formal_name Ovis sp. #common_name sheep
17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
07-May-1999

ACCESSIONS JW0055
REFERENCE JW0055
#authors Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
Donjerkovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
W.H.
#journal Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title Primary structure of ovine fibroblast growth factor-1 deduced
by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
##molecule_type mRNA
##residues 1-155 #label GRI
COMMENT This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17557 #checksum 8890

Query Match 59.5%; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 2.34e-174;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHEFLRILPDGKVDGTRDSDQHIQLQLSAESVGEVIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 76 ANYKKPKLLYCSNGGHEFLRILPDGTVDTGTRDSDQHIQLQLSAESVGEVIKSTETGQYL 135
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEENHYNTYISKHAENWFVGLKKNKSGKLGPRTHY 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 136 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFVGLKKNKSGCKRGPRTHY 195
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 196 GOKAILFLPLPVSSD 210
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY fibroblast growth factor - mouse
TITLE fibroblast growth factor - mouse
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 21-Nov-1993 #sequence_revision 10-Nov-1995 #text_change
16-Jul-1999

ACCESSIONS S14192; I49665; I49664
REFERENCE S14192
#authors de Lapeyriere, O.; Rosnet, O.; Benharroch, D.; Raybaud, F.;
Marchetto, S.; Planche, J.; Galland, F.; Mattei, M.G.;
Copeland, N.G.; Jenkins, N.A.; Coulier, F.; Birnbaum, D.
Oncogene (1990) 5:823-831
#journal

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#title Structure, chromosome mapping and expression of the murine
Fgf-6 gene.
#cross-references MUID:90295275
#accession S14192
##molecule_type DNA
##residues 1-208 #label LAP
##cross-references EMBL:X51552
##note it is uncertain whether Met-1 or Met-11 is the initiator
REFERENCE I49664
#authors Ollendorff, V.; Rosnet, O.; Marics, I.; Birnbaum, D.;
delapeyriere, O.
#journal Biochimie (1992) 74:1035-1038
#title Isolation and sequence of the murine Fgf6 cDNA.
#cross-references MUID:93120244
#accession I49665
##status preliminary; translated from GB/EMBL/DDBJ
##molecule_type mRNA
##residues 19-208 #label RES
##cross-references GB:M92416; NID:g193288; PIDN:AAA62261.1; PID:g666915
#accession I49664
##status preliminary; translated from GB/EMBL/DDBJ
##molecule_type DNA
##residues 1-18 #label RE2
##cross-references GB:M92415; NID:g193286; PIDN:AAA62260.1; PID:g193287
GENETICS
#gene Fgf6
#introns 116/1; 150/3
#superfamily fibroblast growth factor
#length 208 #molecular-weight 22798 #checksum 6314
SUMMARY
Query Match 46.1%; Score 702; DB 2; Length 208;
Best Local Similarity 55.6%; Pred. No. 1.66e-127;
Matches 114; Conservative 31; Mismatches 50; Indels 10; Gaps 6;

Db 11 MSRGAGRVGTTQALVFLGVLMVVPSPAGARANGTLLDSRGWGTLLSRSLAGLAEIS 70
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 1 MSRGAGRVGTTQALVFLGVLMVVPSPAGARANGTLLDSRGWGTLLSRSLAGLAEIS 60
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 71 GYNWESGYLVGKRGKQ---R-RL-YCNVIGIHFHQVPPDGRISGTHE-ENPYSLLLEISIV 123
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 61 GYNWESGYLVGKRGKQANYKKPKLLYCSNGGHEFLRILPDGTVDTGTRDSDQHIQLQLSAE 119
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 124 ERGVYSLGVKQKALFIAMNSKGLRTTPSFHDECKFRETLLPNYNNAYESDLYRGF--YI 181
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 120 SVGEVYIKSTETGQYLAAMDITDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFV 179
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 182 ALSKYGRVKGKSGKVPIMTVTHFLP 206
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 180 GLKKNKSGCKRGPRTHY GOKAILFLP 204
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY fibroblast growth factor 6 precursor - human
TITLE fibroblast growth factor-related protein FGF.6; transforming
protein hst-2
ALTERNATE_NAMES
ORGANISM #formal_name Homo sapiens #common_name man
DATE 18-Feb-1994 #sequence_revision 12-Apr-1996 #text_change
29-Aug-1997
ACCESSIONS S20102; S23739; S04204; S36910
REFERENCE S20102
#authors Coulier, F.; Batoz, M.; Marics, I.; de Lapeyriere, O.;
Birnbaum, D.
#journal Oncogene (1991) 6:1437-1444
#title Putative structure of the FGF6 gene product and role of the
signal peptide.
#cross-references MUID:91360279
#accession S20102
##status not compared with conceptual translation
##molecule_type DNA
##residues 1-208 #label COU
##cross-references EMBL:X57075
##note it is uncertain whether Met-1, Met-11 or Met-34 is the

```

```

REFERENCE S23739 initiator
#authors Iida, S.; Yoshida, T.; Naito, K.; Sakamoto, H.; Katoh, O.;
#journal Hirohashi, S.; Sato, T.; Onda, M.; Sugimura, T.; Terada, M.
#title Oncogene (1992) 7:303-309
#cross-references MUID:92195660
#accession S23739
#molecule_type mRNA
#residues 1-208 #label IID
#cross-references EMBL:X63454
#note it is uncertain whether Met-1 or Met-11 is the initiator
#accession S04204
#authors Marics, I.; Adelaide, J.; Raybaud, F.; Mattei, M.G.; Coulier,
#journal F.; Planche, J.; de Lapeyriere, O.; Birnbaum, D.
#title Oncogene (1989) 4:335-340
#cross-references MUID:89201880
#accession S04204
#molecule_type DNA
#residues 81-99, 'G', 101-208 #label MAR
#cross-references EMBL:X14071
GENETICS
#gene GDB:FGF6; hst-2
#map_position 12p13-12p13
#introns 115/3; 150/2
CLASSIFICATION #superfamily fibroblast growth factor
FEATURE
1-40 #domain (or 11-40 or 34-40) signal sequence #status
predicted #label SIG
#product fibroblast growth factor 6 #status predicted
#label MAT
SUMMARY #length 208 #molecular-weight 22904 #checksum 6745
Query Match 44.7%; Score 681; DB 2; Length 208;
Best Local Similarity 53.7%; Pred. No. 1.00e-122;
Matches 110; Conservative 35; Mismatches 50; Indels 10; Gaps 7;
Db 11 MSRGAGRLQGLTALVFLGILVGVVSPAGTRANNLLDSRGVTLSSRAGLAGEIA 70
QY 1 MSRGAGRVQGTQALVFLGVVGVVSPAGARANGTLDSRGVTLSSRAGLAGEIS 60
Db 71 GVNKESGLVGIKRO----R-RL-YCNVIGFHLQVLPDGRISCTHE-ENPYSLLLEISTV 123
QY 61 GVNKESGLVGIKROQYKPKLLYCSNGGHF-LRILPDGTVDGTRDRSDQHOIQLQLSAE 119
Db 124 ERGVVSLFGVRSALFVAMNSKGRLYATPSFOECKFRFETLLPNNYAYESDLY-QGT-YI 181
QY 120 SVGEVYIKSTGTGYLANDTGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFV 179
Db 182 ALSKYGRKRGSKVSPIMVTHFLP 206
QY 180 GLKKNKSGKRGPRTHYGOKAILFLP 204
RESULT 11
ENTRY A48834 #type complete
TITLE basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE A48834
#authors Borja, A.Z.; Meijers, C.; Zeller, R.
#journal Dev. Biol. (1993) 157:110-118
#title Expression of alternatively spliced bFGF first coding exons
and antisense mRNAs during chicken embryogenesis.
#cross-references MUID:93246053
#accession A48834
#status preliminary

```

```

#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note sequence extracted from NCBI backbone (NCBIN:131000,
NCBIP:131001)
REFERENCE S23636
#authors Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the
early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:g62855; PIDN:CAA40139.1; PID:g62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 189 #molecular-weight 20312 #checksum 8538
Query Match 34.3%; Score 522; DB 2; Length 189;
Best Local Similarity 54.5%; Pred. No. 6.67e-87;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 58 GHFKDPKRLYCKNGGFFLRINPDGRVDGVRKSDPHIKLQQAERGVSIVKGVANREL 117
QY 76 ANYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHOIQLQLSAESVGEYIKSTGTGYL 135
Db 118 AMKEDGRLLAKALCAEECFERLESNNNTYRSKYS--WYVALKRTGQYKPGKPTGP 175
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGKRGPRTHY 195
Db 176 GOKAILFLPMSAKS 189
QY 196 GOKAILFLPLPVSS 209
RESULT 12
ENTRY S00185 #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatropin
ORGANISM #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS S00185
REFERENCE S00185
#authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
E.C.; Rubira, M.R.; Burgess, A.W.
#journal FEBS Lett. (1987) 224:128-132
#title Primary structure of ovine pituitary basic fibroblast growth
factor.
#cross-references MUID:88055577
#accession S00185
#molecule_type protein
#residues 1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding; mitogen
FEATURE
18-22 #region heparin binding #status predicted\
107-110 #region heparin binding #status predicted
SUMMARY #length 146 #molecular-weight 16434 #checksum 3560
Query Match 33.9%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 1.45e-85;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 15 GHFKDPKRLYCKNGGFFLRINPDGRVDGVRKSDPHIKLQQAERGVSIVKGVANRYL 74
QY 76 ANYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHOIQLQLSAESVGEYIKSTGTGYL 135
Db 75 AMKEDGRLLAKCVTDECFERLESNNNTYRSKYS--SWYVALKRTGQYKPGKPTGP 132
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGKRGPRTHY 195

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Db 133 GOKAILFLPMGSAKS 146
|||||:|
Qy 196 GOKAILFLPLPVSS 209

RESULT 13
ENTRY GKB0B #type fragment
TITLE basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES bFGF: kidney-derived growth factor; prostatriptan
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS A24663: A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
A94290
REFERENCE
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjertild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
##molecule_type mRNA
##residues 3-157 #label ABR
##cross-references GB:M13440; NID:G163049; PIDN:AAA30518.1; PID:G163050
##experimental_source pituitary gland
A90924
REFERENCE
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession A32878
##molecule_type mRNA
##residues 3-157 #label AB2
REFERENCE
#authors Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel,
N.R.; Deuel, T.F.
#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
bovine uterus: purification and N-terminal amino acid
sequence
#cross-references MUID:90121211
#accession A33784
##molecule_type protein
##residues 1-14 #label MIL
#note demonstration of a possible alternative initiator or
splice junction
REFERENCE
A61550
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterisation and tissue localisation of an
N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
##molecule_type protein
##residues 16-35 #label BER
REFERENCE
A61551
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
##molecule_type protein
##residues 27-35 'X', 37-41 #label UE3
##experimental_source testes
#note This form appears to be identical to the renal form
REFERENCE
A60310
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
factor from bovine liver: structural homology with basic
fibroblast growth factor.
#cross-references MUID:87119185
#accession A60310
##molecule_type protein
##residues 23-35 'X', 37-42 #label UEN
##experimental_source liver
REFERENCE
A24819
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
composition matched what was thought to be the signal
sequence
REFERENCE
A61094
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
Bohlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
##molecule_type protein
##residues 12-25, 27-35, 'X', 37-40 #label GOS
##experimental_source adrenal gland
REFERENCE
A01386
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
factor (FGF) and comparison with the amino-terminal
sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386
##molecule_type protein
##residues 12-157 #label ESC
##experimental_source pituitary gland
REFERENCE
A60316
#authors Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
growth factor from the bovine kidney: homology with basic
fibroblast growth factor.
#cross-references MUID:86095426
#accession A60316
##molecule_type protein
##residues 27-35, 'X', 37-43 #label BAI
##experimental_source kidney
REFERENCE
A22054
#authors Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
##molecule_type protein
##residues 12-26 #label BOH
#note The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells).
#comment This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

```

Search completed: Tue Aug 29 16:13:14 2000
Job time : 70 secs.

M A S R C H
(TM)

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Msrch_pp protein - protein database search, using Smith-Waterman algorithm
Run on: Tue Aug 29 16:10:16 2000; MasPar time 8.09 Seconds
804.050 Million cell updates/sec
Bular output not generated.

Title: >US-09-121-017B-27-
Description: (1-210) from US09121017B.pep
Perfect Score: 1522
Sequence: 1 MSRGAGRVQGTQALVELGV.....PRTHYGKAILFLPLPVSSD 210

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 08
Listing first 45 summaries

Database: swiss-prot38
1:swissprot

Statistics: Mean 45.430; Variance 71.241; scale 0.638

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Description	ID	Pred. No.
1	984	64.7	HEPARIN-BINDING GROWTH	1	1.76e-219
2	967	63.5	HEPARIN-BINDING GROWTH	1	5.53e-215
3	966	63.5	HEPARIN-BINDING GROWTH	1	1.02e-214
4	953	62.6	HEPARIN-BINDING GROWTH	1	2.78e-211
5	917	60.2	HEPARIN-BINDING GROWTH	1	8.84e-202
6	916	60.2	HEPARIN-BINDING GROWTH	1	1.62e-201
7	702	46.1	FIBROBLAST GROWTH FACT	1	1.78e-145
8	681	44.7	FIBROBLAST GROWTH FACT	1	5.00e-140
9	522	34.3	HEPARIN-BINDING GROWTH	1	3.26e-99
10	516	33.9	HEPARIN-BINDING GROWTH	1	1.08e-97
11	516	33.9	HEPARIN-BINDING GROWTH	1	1.08e-97
12	508	33.4	HEPARIN-BINDING GROWTH	1	1.15e-95
13	508	33.4	HEPARIN-BINDING GROWTH	1	1.15e-95
14	509	33.4	HEPARIN-BINDING GROWTH	1	6.42e-96
15	498	32.7	HEPARIN-BINDING GROWTH	1	3.89e-93
16	489	32.1	HEPARIN-BINDING GROWTH	1	7.27e-91
17	466	30.6	HEPARIN-BINDING GROWTH	1	4.45e-85
18	375	24.7	FIBROBLAST GROWTH FACT	1	9.49e-63
19	361	23.7	GLIA-ACTIVATING FACTOR	1	4.30e-59
20	350	23.0	GLIA-ACTIVATING FACTOR	1	2.05e-56
21	350	23.0	GLIA-ACTIVATING FACTOR	1	2.05e-56
22	350	23.0	GLIA-ACTIVATING FACTOR	1	2.05e-56
23	341	22.4	FIBROBLAST GROWTH FACT	1	3.09e-54

24	329	21.6	207	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	2.40e-51
25	324	21.3	207	1	FGF4_RAT	FIBROBLAST GROWTH FACT	3.80e-50
26	310	20.4	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT	8.38e-47
27	307	20.2	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT	4.33e-46
28	302	19.8	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA	6.06e-45
29	299	19.6	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA	3.42e-44
30	295	19.4	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA	3.01e-43
31	279	18.3	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT	1.73e-39
32	277	18.2	208	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	5.06e-39
33	277	18.2	215	1	FGF4_RAT	FIBROBLAST GROWTH FACT	5.06e-39
34	277	18.2	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT	5.06e-39
35	274	18.0	247	1	FGF6_MOUSE	FIBROBLAST GROWTH FACT	2.53e-38
36	272	17.9	206	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	7.39e-38
37	273	17.9	209	1	FGF4_MOUSE	FIBROBLAST GROWTH FACT	4.33e-38
38	273	17.9	247	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	4.33e-38
39	271	17.8	194	1	FGF7_RAT	KERATINOCYTE GROWTH FA	1.26e-37
40	269	17.7	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT	3.88e-37
41	266	17.5	256	1	FGF3_BRARE	FIBROBLAST GROWTH FACT	1.83e-36
42	263	17.3	225	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	9.02e-36
43	257	16.9	225	1	FGF4_MOUSE	FIBROBLAST GROWTH FACT	2.18e-34
44	256	16.8	202	1	FGF4_MOUSE	FIBROBLAST GROWTH FACT	3.70e-34
45	256	16.3	243	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	3.70e-34

ALIGNMENTS

RESULT 1
ID FGF4_HUMAN STANDARD; PRT; 155 AA.
AC P05230; P07502;
DT 13-AUG-1987 (Rel. 05, Created)
DT 13-AUG-1987 (Rel. 05, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).
DE GN FGF1 OR FGFA.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Homnidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 86261805.
RA Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;
RT "Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization."
RL Science 233:541-545(1986).
RN [2]
RP SEQUENCE FROM N.A.
RX TISSUE-BRAIN STEM;
RA Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;
RT "Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues."
RL Mol. Cell. Biol. 9:2387-2395(1989).
RN [3]
RP SEQUENCE FROM N.A.
RX TISSUE-BRAIN STEM;
RA Chiu I.M., Wang W.P., Lehtoma K.;
RT "Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1."
RL Oncogene 5:755-762(1990).
RN [4]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90073637.
RA Mergia A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;
RT "Structural analysis of the gene for human acidic fibroblast growth factor."
RL Biochem. Biophys. Res. Commun. 164:1121-1129(1989).
RN [5]
RP SEQUENCE FROM N.A.

RX MEDLINE; 92019819.
 RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;
 RT "Cloning and sequence analysis of the human acidic fibroblast growth
 factor gene and its preservation in leukemia patients.";
 RN Oncogene 6:1521-1529(1991).
 [6]
 RX SEQUENCE FROM N.A.
 RP MEDLINE; 92202857.
 RA Li Y.L., Kha H., Golden J.A., Migchelsen A.A.J., Goetzl E.J.,
 RA Turk E.J.;
 RT "An acidic fibroblast growth factor protein generated by alternate
 RT splicing acts like an antagonist.";
 RL J. Exp. Med. 175:1073-1080(1992).
 [7]
 RX SEQUENCE OF 1-154 FROM N.A.
 RP MEDLINE; 94069734.
 RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;
 RT "The expression of acidic fibroblast growth factor (heparin-binding
 RT growth factor-1) and cytokine genes in human cardiac allografts and T
 RT cells.";
 RL Transplantation 56:1177-1182(1993).
 [8]
 RX SEQUENCE OF 1-40 FROM N.A.
 RP MEDLINE; 90365758.
 RA Crumley G., Dionne C.A., Jaye M.;
 RT "The gene for human acidic fibroblast growth factor encodes two
 RT upstream exons alternatively spliced to the first coding exon.";
 RL Biochem. Biophys. Res. Commun. 171:7-13(1990).
 [9]
 RX SEQUENCE OF 16-155.
 RP MEDLINE; 86296647.
 RA Harper J.W., Strydom D.J., Lobb R.R.;
 RT "Human class I heparin-binding growth factor: structure and homology
 RT to bovine acidic brain fibroblast growth factor.";
 RL Biochemistry 25:4097-4103(1986).
 [10]
 RX SEQUENCE OF 16-155.
 RP MEDLINE; 86295741.
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
 RT "The complete amino acid sequence of human brain-derived acidic
 RT fibroblast growth factor.";
 RL Biochem. Biophys. Res. Commun. 138:611-617(1986).
 [11]
 RX SEQUENCE OF 16-155.
 RP MEDLINE; 87048871.
 RA Gutschli-Sova P., Mueller T., Boehlen P.;
 RT "Amino acid sequence of human acidic fibroblast growth factor.";
 RL Biochem. Biophys. Res. Commun. 140:874-880(1986).
 [12]
 RX SEQUENCE OF 16-47.
 RP MEDLINE; 86186784.
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
 RT "Human brain-derived acidic and basic fibroblast growth factors:
 RT amino terminal sequences and specific mitogenic activities.";
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
 [13]
 RX SEQUENCE OF 16-49.
 RP MEDLINE; 86275260.
 RA Gutschli P., Frater-Schroeder M., Boehlen P.;
 RT "Partial molecular characterization of endothelial cell mitogens from
 RT human brain: acidic and basic fibroblast growth factors.";
 RL FEBS Lett. 204:203-207(1986).
 [14]
 RX X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
 RP MEDLINE; 96194129.
 RA Blaber M., Disalvo J., Thomas K.A.;
 RT "X-ray crystal structure of human acidic fibroblast growth factor.";
 RL Biochemistry 35:2086-2094(1996).
 [15]
 RX STRUCTURE BY NMR OF 24-155.
 RP MEDLINE; 94358885.
 RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,
 RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast
 RT growth factor activated by inositol hexasulfate.";
 RL J. Mol. Biol. 243:81-98(1994).
 [16]
 RX STRUCTURE BY NMR OF 24-155.
 RP MEDLINE; 97107535.
 RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
 RA Rico M., Gimenez-Gallego G.;
 RT "Three-dimensional structure of acidic fibroblast growth factor in
 RT solution: effects of binding to a heparin functional analog.";
 RL J. Mol. Biol. 264:162-178(1996).
 [17]
 RX STRUCTURE BY NMR OF 25-155.
 RP MEDLINE; 98387896.
 RA Lozano R.M., Gimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
 RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
 RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral
 RT action of suramin and suradistas.";
 RL J. Mol. Biol. 281:899-915(1998).
 CC 1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC 1- SUBUNIT: MONOMER.
 CC 1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC 1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC -----
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 CC -----
 DR EMBL; M1361; AAA79245.1;
 DR EMBL; X51943; CAA36206.1;
 DR EMBL; M30492; AAA52446.1;
 DR EMBL; M30490; AAA52446.1; JOINED.
 DR EMBL; M30491; AAA52446.1; JOINED.
 DR EMBL; M60515; AAA51672.1;
 DR EMBL; M60516; AAA51673.1;
 DR EMBL; M23087; AAA52638.1;
 DR EMBL; M23086; AAA52638.1; JOINED.
 DR EMBL; S67291; AAB29057.1;
 DR EMBL; X65778; CAA46661.1;
 DR PIR; A23553; A23553.
 DR PIR; A24243; A24243.
 DR PIR; A24301; A24301.
 DR PIR; A24662; A24662.
 DR PIR; A24820; A24820.
 DR PIR; A26386; A26386.
 DR PIR; A33665; A33665.
 DR PIR; S18217; S18217.
 DR PDB; 2AFG; 15-OCT-95.
 DR PDB; 1AXM; 22-APR-98.
 DR PDB; 2AXM; 22-APR-98.
 DR PDB; 1RML; 11-NOV-98.
 DR MIM; 131220;
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 DR PROSITE; PR00263; HBGF_FGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 KW 3D-structure.
 FT PROPEP 1 15
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
 FT MOD_RES 2 2 ACETYLATION.
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 FT SEQUENCE 155 AA; 17460 MW; F586E8BF09F1580 CRC64;
 SQ

Query Match 64.78; Score 984; DB 1; Length 155;
 Best Local Similarity 99.3%; Pred. No. 1.76e-219;
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKLLYCSNGGHFLRLPDGTGDRSDQHQIQLSASGEVYIKSTETGQYL 80
 :|||||
 QY 76 ANYKKLLYCSNGGHFLRLPDGTGDRSDQHQIQLSASGEVYIKSTETGQYL 135
 :|||||
 Db 81 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAKNFWGLKKNCKRGPRTHY 140
 :|||||
 QY 136 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAKNFWGLKKNCKRGPRTHY 195
 :|||||
 Db 141 GQKAILFLPLPVSSD 155
 :|||||
 QY 196 GQKAILFLPLPVSSD 210
 :|||||

RESULT 2
 ID FGF1_MESAU STANDARD; PRT; 155 AA.
 AC P34004;
 DT 01-FEB-1994 (Rel. 28, Created)
 DT 01-FEB-1994 (Rel. 28, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF).
 DE GROWTH FACTOR) (AFGF).
 GN FGF1 OR FGF-1.
 OS Mesocricetus auratus (Golden hamster).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;
 OC Mesocricetus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 90270291.
 RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;
 RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene and cDNA
 RT and its modulation by steroids.";
 RL J. Cell. Biochem. 43:17-26(1990).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC PIR; A60721; A60721.
 DR HSSP; P05230; 2AXM.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 15 BY SIMILARITY.
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17403 MW; 4185EC760E412CC5 CRC64;

Query Match 63.58; Score 967; DB 1; Length 155;
 Best Local Similarity 97.04; Pred. No. 5.53e-215;
 Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKLLYCSNGGHFLRLPDGTGDRSDQHQIQLSASGEVYIKSTETGQYL 80
 :|||||
 QY 76 ANYKKLLYCSNGGHFLRLPDGTGDRSDQHQIQLSASGEVYIKSTETGQYL 135
 :|||||
 Db 81 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAKNFWGLKKNCKRGPRTHY 140
 :|||||
 QY 136 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAKNFWGLKKNCKRGPRTHY 195
 :|||||
 Db 141 GQKAILFLPLPVSSD 155
 :|||||
 QY 196 GQKAILFLPLPVSSD 210
 :|||||

RESULT 3
 ID FGF1_MOUSE STANDARD; PRT; 155 AA.
 AC P10935;
 DT 01-JUL-1989 (Rel. 11, Created)
 DT 01-JUL-1989 (Rel. 11, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF).
 DE GROWTH FACTOR) (AFGF).
 GN FGF1 OR FGF-1 OR FGFA.
 OS Mus musculus (Mouse), and Rattus norvegicus (Rat).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX SPECIES-RAT;
 RC MEDLINE; 89240051.
 RA Goodrich S., Van G.C., Bahrenburg K., Mansson P.E.;
 RT "The nucleotide sequence of rat heparin binding growth factor 1
 RT (HBGF-1)." ;
 RL Nucleic Acids Res. 17:2867-2867(1989).
 RN [2]
 RP SEQUENCE FROM N.A.
 RX SPECIES-MOUSE;
 RC MEDLINE; 90201563.
 RA Hebert J.M., Basillco C., Goldfarb M., Haub O., Martin J.R.;
 RT "Isolation of cDNAs encoding four mouse FGF family members and
 RT characterization of their expression patterns during embryogenesis." ;
 RL Dev. Biol. 138:454-463(1990).
 RN [3]
 RP SEQUENCE FROM N.A.
 RX SPECIES-MOUSE;
 RC MEDLINE; 97128312.
 RA Madial F., Hackshaw K.V., Chiu I.M.;
 RT "Cloning and characterization of the mouse Fgf-1 gene." ;
 RL Gene 179:231-236(1996).
 RN [4]
 RP SEQUENCE FROM N.A.
 RX SPECIES-MOUSE; STRAIN-BALB/C;
 RC MEDLINE; 97094746.
 RA Alam K.Y., Frosthalm A., Hackshaw K.V., Evans J.E., Fother A.,
 RA Chiu I.M.;
 RT "Characterization of the 1B promoter of fibroblast growth factor 1
 RT and its expression in the adult and developing mouse brain." ;
 RL J. Biol. Chem. 271:30263-30271(1996).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 DR EMBL; X14232; CAA32448.1; -;
 DR EMBL; M30641; AAA37618.1; -;
 DR EMBL; U36459; AAC52969.1; -;
 DR EMBL; U36457; AAC52969.1; JOINED.
 DR EMBL; U36458; AAC52969.1; JOINED.
 DR EMBL; U67610; AAC52907.1; -;
 DR PIR; S04147; S04147.
 DR PIR; D37360; D37360.
 DR HSSP; P05230; 2AXM.
 DR MGD; MGI:95515; FGF1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.

DR PRINTS; PR00263; HBGF_FGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0BA4161 CRC64;

Query Match 63.5%; Score 966; DB 1; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.02e-214;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRSDQHQLQLSAESVGEVYIKSTETGOYL 80
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRSDQHQLQLSAESVGEVYIKSTETGOYL 135
Db 81 AMDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 140
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 195
Db 141 GOKAILFLPLPVSSD 155
QY 196 GOKAILFLPLPVSSD 210

RESULT 4
ID FGF1_PIG STANDARD; PRT; 152 AA.
AC P20002;
DT 01-FEB-1991 (Rel. 17, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR) (FRAGMENT).
DE (FRAGMENT).
GN Sus scrofa (Pig).
OS Sus scrofa (Pig).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=HEART;
RX MEDLINE; 92062117.
RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;
RT "Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (AFGF) from porcine heart."
RL Biochem. Biophys. Res. Commun. 180:853-859(1991).
[2]
PP SEQUENCE OF 22-41.
RX MEDLINE; 89231704.
RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,
RA Sharma H.S., Schaper W.;
RT "Isolation of heparin-binding growth factors from bovine, porcine and canine hearts."
RL Eur. J. Biochem. 181:67-73(1989).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC
DR EMBL; X60317; CAA42869.1; -

DR PIR; S03954; S03954.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.
FT CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
FT CONFLICT 31 31 C -> S (IN REF. 2).
FT CONFLICT 39 39 R -> Y (IN REF. 2).
FT NON_TER 152 152
SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 62.6%; Score 953; DB 1; Length 152;
Best Local Similarity 97.0%; Pred. No. 2.78e-211;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRSDQHQLQLSAESVGEVYIKSTETGOYL 80
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRSDQHQLQLSAESVGEVYIKSTETGOYL 135
Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 140
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTHY 195
Db 141 GOKAILFLPLPV 152
QY 196 GOKAILFLPLPV 207

RESULT 5
ID FGF1_BOVIN STANDARD; PRT; 155 AA.
AC P03968;
DT 23-OCT-1986 (Rel. 02, Created)
DT 01-MAR-1989 (Rel. 10, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF II).
GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae; Bovidae; Bovinae; Bos.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89083506.
RA Halley C., Courtois Y., Laurent M.;
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA."
RL Nucleic Acids Res. 16:10913-10913(1988).
[2]
RP SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89078619.
RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
RT "Characterization of a bovine acidic GF cDNA clone and its expression in brain and retina."
RL FEBS Lett. 242:41-46(1988).
[3]
RP SEQUENCE OF 2-155.
RX MEDLINE; 87016918.
RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
RT "Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor."
RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
[4]
RN SEQUENCE OF 2-155.
RX MEDLINE; 87026586.

RA Crabb J.W., Ames L.G., Carr S.A., Johnson C.M., Roberts G.D.,
 RA Bordoli R.S., McKeehan W.L.;
 RT "Complete primary structure of prostatropin, a prostate epithelial
 RT cell growth factor.";
 RL Biochemistry 25:4988-4993(1986).
 RN [5]
 RP SEQUENCE OF 16-155.
 RX MEDLINE: 86070224.
 RA Gimenez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,
 RA Disalvo J., Thomas K.;
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid
 RT sequence and homologues.";
 RL Science 230:1385-1388(1985).
 RN [6]
 RP SEQUENCE OF 16-44, AND COMPOSITION.
 RX MEDLINE: 86055750.
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:
 RT amino-terminal sequence and comparison with basic FGF.";
 RL EMBO J. 4:1951-1956(1985).
 RN [7]
 RP SEQUENCE OF 16-56 FROM N.A.
 RX MEDLINE: 86261806.
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,
 RA Hjerfild K.A., Gospodarowicz D., Fiddes J.C.;
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic
 RT protein, basic fibroblast growth factor.";
 RL Science 233:545-548(1986).
 RN [8]
 RP SEQUENCE OF 16-45.
 RX MEDLINE: 89231704.
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethe N.,
 RA Sharma H.S., Schaper W.;
 RT "Isolation of heparin-binding growth factors from bovine, porcine and
 RT canine hearts.";
 RL Eur. J. Biochem. 181:67-73(1989).
 RN [9]
 RP SEQUENCE OF 1-18 FROM N.A.
 RX MEDLINE: 91095983.
 RA Philippe J.M., Renaud F., Desset S., Laurent M.;
 RL Submitted (JUL-1992) to the EMBL/GenBank/DBJ databases.
 RN [10]
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
 RX MEDLINE: 91095983.
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RA Hsu B.T., Rees D.C.;
 RT "Three-dimensional structures of acidic and basic fibroblast growth
 RT factors.";
 RL Science 251:90-93(1991).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 CC EMBL: M13439; AAA30516.1; -
 CC EMBL: X13221; CAA31610.1; -
 CC EMBL: X14032; CAA32192.1; -
 CC EMBL: M35608; AAA30517.1; -
 CC EMBL: X66446; CAA47063.1; -
 CC EMBL: M97660; AAA30563.1; -
 CC EMBL: M97661; AAA30564.1; -
 CC PIR: A01385; GKBOA.

DR PIR: A25043; A25043.
 DR PIR: B25043; B25043.
 DR PIR: C25043; C25043.
 DR PIR: A24477; A24477.
 DR PIR: B24663; B24663.
 DR PIR: S02102; S02102.
 DR PDB: 1BAR; 31-OCT-93.
 DR PDB: 1AFC; 31-OCT-93.
 DR PFAM: PF00167; FGF; 1.
 DR PRINTS: PR00262; ILJHGF.
 DR PRINTS: PR00283; HBGF_FGF.
 DR PROSITE: PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 KW 3D-structure.
 FT PROPEP 1 15
 FT CHAIN 2 155
 FT CHAIN 16 155
 FT CHAIN 22 155
 FT MOD_RES 2 2
 FT BINDING 24 28
 FT BINDING 113 116
 FT STRAND 27 31
 FT TURN 32 34
 FT TURN 37 40
 FT TURN 42 43
 FT STRAND 46 49
 FT HELIX 55 57
 FT STRAND 59 61
 FT STRAND 69 69
 FT STRAND 71 73
 FT TURN 84 85
 FT TURN 87 91
 FT STRAND 96 98
 FT STRAND 100 100
 FT STRAND 103 104
 FT TURN 106 107
 FT STRAND 110 111
 FT STRAND 113 114
 FT TURN 116 121
 FT STRAND 123 123
 FT STRAND 126 126
 FT TURN 128 129
 FT STRAND 132 132
 FT STRAND 134 134
 FT STRAND 135 137
 FT HELIX 140 141
 FT TURN 144 145
 FT STRAND 147 150
 SQ SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;
 Query Match 60.2%; Score 917; DB 1; Length 155;
 Best Local Similarity 91.9%; Pred. No. 8.84e-202;
 Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;
 DB 21 GNYKPKLYCSNGGYFLRILPDGTGDKRSDQHQIQLCAESIGEVYIKSTGTQQL 80
 QY 76 ANKPKPKLYCSNGGHFLRILPDGTGDKRSDQHQIQLCAESVGEVIKSTGTQYL 135
 DB 81 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKRAEKHFVGLKNGRSLKGPRTHF 140
 QY 136 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKRAEKHFVGLKNGRSLKGPRTHY 195
 DB 141 GOKAILFLPLPVSSD 155
 QY 196 GOKAILFLPLPVSSD 210
 RESULT 6
 ID FGF1_CHICK STANDARD; PRT; 155 AA.
 AC P19596;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)

CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
DR EMBL; M95707; AAA48617.1; -.
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF. 1.
DR PRINTS; PR00262; ILLHGF.
DR PRINTS; PR00263; HGFEGF.
DR PROSITE; PS00247; HBGF_FGF. 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 12 BY SIMILARITY.
FT CHAIN 13 158 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 30 34 HEPARIN (POTENTIAL).
FT BINDING 119 122 HEPARIN (POTENTIAL).
SQ BINDING 158 AA; 17374 MW; 7869B684C17F1816 CRC64;
Query Match 34.3%; Score 522; DB 1; Length 158;
Best Local Similarity 54.5%; Pred. No. 3.26e-99;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 27 GHFKDPKRLCYCKNGFFLRINPDGRVGVREKSDPHIKLQLOAEERGVVSIKGVSCANRFL 86
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVGTRSDQHQIQLQLSAESVGEVIKSTETGQYL 135
Db 87 ANKEDGRLLALKCANECFFERLESNNYNTYRSKYS--HYVALKRTGQYKPKPTGP 144
QY 136 AMDTDGLLYGTSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195
Db 145 GOKAILFLPMSAKS 158
QY 196 GOKAILFLPVS 209
RESULT 10
ID FGF2_SHEEP STANDARD; PRT; 155 AA.
AC P20003.
DT 01-FEB-1991 (Rel. 17, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Ovis aries (Sheep).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Euthera; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Caprinae; Ovis.
RN [1]
RP SEQUENCE FROM N.A.
RA Sutton R., Ward W.G., Raphael K.A., Cam G.R.;
RL Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.
RN [2]
RX MEDLINE; 88055577.
RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.,
RA Rubira M.R., Burgess A.W.;
RT "Primary structure of ovine pituitary basic fibroblast growth
factor.";
RL FEBS Lett. 224:128-132(1987).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; L36136; AAA31519.1;
CC PIR; S00185; S00185.
CC HSSP; P09038; 1BFF.
CC PFAM; PF00167; FGF_1.
CC PRINTS; PR00262; ILLHBGF.
CC PRINTS; PR00263; HBGF_FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).
FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;
Query Match 33.9%; Score 516; DB 1; Length 155;
Best Local Similarity 55.2%; Pred. No. 1.08e-97;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 24 GHFKDPKRLCYCKNGFFLRINPDGRVGVREKSDPHIKLQLOAEERGVVSIKGVSCANRFL 83
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVGTRSDQHQIQLQLSAESVGEVIKSTETGQYL 135
Db 84 AMKEDGRLLASKCVTDCEFFERLESNNYNTYRSKYS--SWYVALKRTGQYKPKPTGP 141
QY 136 AMDTDGLLYGTSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195
Db 142 GOKAILFLPMSAKS 155
QY 196 GOKAILFLPVS 209
RESULT 11
ID FGF2_BOVIN STANDARD; PRT; 155 AA.
AC P03969;
DT 23-OCT-1986 (Rel. 02, Created)
DT 23-OCT-1986 (Rel. 02, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN) [CONTAINS: KIDNEY-DERIVED GROWTH
DE FACTOR].
GN FGF2 OR FGF-2.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Euthera; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Bovinae; Bos.
RN [1]
RP SEQUENCE FROM N.A.
RA Abraham J.A., Whang J.L., Tumolo A., Friedman J.,
RA Hjerild K.A., Gospodarowicz D., Fiddes J.C.;
RT "Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.";
RL Science 233:545-548(1986).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87217066.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence, genomic
organization, and expression in mammalian cells.";
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
RN [3]
RP SEQUENCE OF 10-155.
RX MEDLINE; 86016731.
RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,
RA Gospodarowicz D., Boehlen P., Guillemin R.;
RT "Primary structure of bovine pituitary basic fibroblast growth factor
(FGF) and comparison with the amino-terminal sequence of bovine brain
acidic FGF.";
RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).
RN [4]
RP SEQUENCE OF 1-9.
RX MEDLINE; 86295737.
RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;
RT "Isolation of an amino terminal extended form of basic fibroblast
growth factor.";
RL Biochem. Biophys. Res. Commun. 138:580-588(1986).
RN [5]
RP SEQUENCE OF 25-41.

RC TISSUE-KIDNEY;
RX MEDLINE; 86095426.
RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;
RT "Isolation and partial characterization of an endothelial cell growth
factor from the bovine kidney: homology with basic fibroblast growth
factor.";
RL Regul. Pept. 12:201-213(1985).
RN [6]
RP SEQUENCE OF 21-40.
RQ TISSUE-KIDNEY;
RX MEDLINE; 87119165.
RA Ueno N., Baird A., Esch F., Shimasaki S., Ling N., Guillemin R.;
RT "Purification and partial characterization of a mitogenic factor from
bovine liver: structural homology with basic fibroblast growth
factor.";
RL Regul. Pept. 16:135-145(1986).
RN [7]
RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
RQ MEDLINE; 91095983.
RX Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,
Hsu B.T., Rees D.C.;
RT "Three-dimensional structures of acidic and basic fibroblast growth
factors.";
RL Science 251:90-93(1991).
RQ -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CONCENTRATION OF THESE 2 GROWTH FACTORS.
RQ -1- SUBUNIT: MONOMER.
RQ -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
RQ -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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RQ EMBL; M13440; AAA30518.1; -;
DR PIR; A24863; GRBOB.
DR PIR; A24819; A24819.
DR PIR; A32878; A32878.
DR PDB; 1BAS; 31-OCT-93.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILLHGF.
DR PROSITE; PS00263; HGF_FGF.
DR PROSITE; PS00247; HGF_FGF; 1.
RQ Growth factor; Mitogen; Vascularization; Heparin-binding;
3D-structure.
KW PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
FT STRAND 30 34
FT TURN 35 38
FT STRAND 39 43
FT TURN 45 46
FT STRAND 49 52
FT TURN 55 56
FT STRAND 58 60
FT STRAND 62 68
FT TURN 69 70
FT STRAND 71 76
FT TURN 77 80
FT STRAND 81 85
FT TURN 87 88
FT STRAND 91 94

FT HELIX 99 101
FT STRAND 103 107
FT TURN 109 110
FT STRAND 113 117
FT TURN 121 122
FT STRAND 124 124
FT STRAND 127 127
FT TURN 129 130
FT STRAND 133 133
FT HELIX 136 138
FT TURN 141 142
FT HELIX 144 146
FT STRAND 149 151
SQ SEQUENCE 155 AA; 17250 MW; B56CE70FA6107129 CRC64;
Query Match 33.9%; Score 516; DB 1; Length 155;
Best Local Similarity 55.2%; Pred. No. 1.08e-97;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 24 GHFKDPKRLKCKNGGFFLRHDPGRVGVREKSDPHIKLQQAEEGVVSVKGVCANRYL 83
QY 76 ANKKPKLLKLYCSNGHFLRLPDGTVGTRDSQDHIQLQLSAESVGEVYIKSTFTGQYL 135
Db 84 AKKEDGRLASVCVDEFFERLESNNYRYSKYS--SWYALKRTGYKLGPKTGP 141
QY 136 AMDTGGLYGSQTPNEECIFLERLEENHYTYISKHAEKNWFLGKNGSKCKRPRTHY 195
Db 142 GOKAILFLPMSAKS 155
QY 196 GOKAILFLPLPVSS 209
RESULT 12
ID FGF2 MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RX SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC EMBL; M30644; AAA37621.1; -;
DR PIR; C37360; C37360.
DR HSP; P09038; 1BFF.
DR MGD; MGI:95516; FGF2.
DR PFAM; PF00167; FGF; 1.


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DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGFEGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274386 CRC64;

Query Match 33.4%; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 1.15e-95;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDKRLKRYCKNGGFFLRHDPGRVDGVREKSDPHVKLQQAERGVSIVKGVCANRYL 82
QY 76 ANYKKPKLLKCYSGNGHFLRLPDGTVDGTRDSQHIQLQLSAESVGEVYIKSTGTGYL 135
DB 83 AKMEDGRLLASKCVTECEFFERLESNNYTYRSKYS--SWYVALKRTGOYKLGSKTGP 140
QY 136 AMDTDGLLYGSQTPNECLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195
DB 141 GOKAILFLPMSAKS 154
QY 196 GOKAILFLPLPVSS 209

RESULT 13
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sclurognathi; Muridae; Murinae; Rattus.
[1]
RN SEQUENCE FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;
RX MEDLINE; 89061721.
RA Shinasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RT "Complementary DNA cloning and sequencing of rat ovarian basic
RT fibroblast growth factor and tissue distribution study of its mRNA.";
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).
[2]
RN SEQUENCE FROM N.A.
RC TISSUE-BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
RL Nucleic Acids Res. 16:5201-5201(1988).
[3]
RN SEQUENCE OF 1-28 FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;
RX MEDLINE; 97200905.
RA Pasumathi K.B.S., Jin Y., Cattini P.A.;
RT "Cloning of the rat fibroblast growth factor-2 promoter region and
RT its response to mitogenic stimuli in glioma C6 cells.";
RL J. Neurochem. 68:898-908(1997).
[4]
RN SEQUENCE OF 35-154 FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Mval Y., Shiu R.P.C.;
RT "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
RT mRNA containing a unique 3' untranslated region.";
RL Biochim. Biophys. Acta 1131:314-316(1992).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
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CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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CC -----
CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876.
CC PIR; A31674; A31674.
CC HSP; P09038; IBFF.
CC PFAM; PF00167; FGF_1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGFEGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match 33.4%; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 1.15e-95;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDKRLKRYCKNGGFFLRHDPGRVDGVREKSDPHVKLQQAERGVSIVKGVCANRYL 82
QY 76 ANYKKPKLLKCYSGNGHFLRLPDGTVDGTRDSQHIQLQLSAESVGEVYIKSTGTGYL 135
DB 83 AKMEDGRLLASKCVTECEFFERLESNNYTYRSKYS--SWYVALKRTGOYKLGSKTGP 140
QY 136 AMDTDGLLYGSQTPNECLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195
DB 141 GOKAILFLPMSAKS 154
QY 196 GOKAILFLPLPVSS 209

RESULT 14
ID FGF2_HUMAN STANDARD; PRT; 155 AA.
AC P09038;
DT 01-NOV-1988 (Rel. 09, Created)
DT 01-NOV-1988 (Rel. 09, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
[1]
RN SEQUENCE FROM N.A.
RC MEDLINE; 87053817.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,
RA Gospodarowicz D., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence and
RT genomic organization.";
RL EMBO J. 5:2523-2528(1986).
[2]
RN SEQUENCE FROM N.A.
RC
```


RX MEDLINE; 87217066.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence, genomic
RL organization, and expression in mammalian cells."
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
RN [3]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87213238.
RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,
RA Rifkin D.B.;
RT "A form of human basic fibroblast growth factor with an extended
RT amino terminus";
RL Biochem. Biophys. Res. Commun. 144:543-550(1987).
RN [4]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87162468.
RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;
RT "Cloning and expression of cDNA encoding human basic fibroblast
RT growth factor";
RL FEBS Lett. 213:189-194(1987).
RN [5]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89184522.
RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,
RA Liauzun P., Chalou J.P., Tauber J.P., Amalric F., Smith J.A.,
RA Caput D.;
RT "High molecular mass forms of basic fibroblast growth factor are
RT initiated by alternative CUG codons";
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
RN [6]
RP SEQUENCE OF 10-35.
RX MEDLINE; 86275260.
RA Gauschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
RT human brain: acidic and basic fibroblast growth factors";
RL FEBS Lett. 204:203-207(1986).
RN [7]
RP SEQUENCE OF 10-39.
RX MEDLINE; 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
RT amino terminal sequences and specific mitogenic activities";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
RN [8]
RP SEQUENCE OF 2-22.
RX MEDLINE; 87156686.
RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;
RT "Amino-terminal sequence of a large form of basic fibroblast growth
RT factor isolated from human benign prostatic hyperplastic tissue";
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).
RN [9]
RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
RX MEDLINE; 91195367.
RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;
RT "Three-dimensional structure of human basic fibroblast growth
RT factor";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).
RN [10]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 94004464.
RA Eriksson A.E., Cousens L.S., Matthews B.W.;
RT "Refinement of the structure of human basic fibroblast growth factor
RT at 1.6-A resolution and analysis of presumed heparin binding sites by
RT selenate substitution";
RL Protein Sci. 2:1274-1284(1993).
RN [11]
RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).
RX MEDLINE; 91195368.
RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;
RT "Three-dimensional structure of human basic fibroblast growth factor,
RT a structural homolog of interleukin 1 beta";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).
RN [12]

RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 92121151.
RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;
RT "Crystal structure of basic fibroblast growth factor at 1.6-A
RT resolution";
RL J. Biochem. 110:360-363(1991).
RN [13]
RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).
RX MEDLINE; 91095983.
RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
RA Hsu B.F., Rees D.C.;
RT "Three-dimensional structures of acidic and basic fibroblast growth
RT factors";
RL Science 251:90-93(1991).
RN [14]
RP STRUCTURE BY NMR.
RX MEDLINE; 97040521.
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;
RT "High-resolution solution structure of basic fibroblast growth factor
RT determined by multidimensional heteronuclear magnetic resonance
RT spectroscopy";
RL Biochemistry 35:13552-13561(1996).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC
CC EMBL; M17599; AA52534.1; ALT_INIT.
CC EMBL; X04431; CA28027.1; -
CC EMBL; X04432; CA28028.1; -
CC EMBL; X04433; CA28029.1; -
CC EMBL; M27968; AA52448.1; -
CC EMBL; J04513; AA52533.1; ALT_INIT.
CC PIR; A25824; A25824.
CC PIR; A26642; A26642.
CC PIR; B24243; B24243.
CC PIR; B24301; B24301.
CC PIR; B32878; B32878.
CC PIR; S00297; S00297.
CC PDB; 2FGF; 15-APR-92.
CC PDB; 4FGF; 15-JUL-93.
CC PDB; 1FGA; 15-JUL-93.
CC PDB; 1BFB; 03-APR-96.
CC PDB; 1BFC; 03-APR-96.
CC PDB; 1BFF; 16-JUN-97.
CC PDB; 2BFG; 31-JAN-94.
CC PDB; 2BFH; 30-APR-94.
CC PDB; 1BLA; 08-NOV-96.
CC PDB; 1BLD; 08-NOV-96.
CC MIM; 134920; -
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; ILIHGF.
CC PRINTS; PR00263; HBGF.FGF.
CC PROSITE; PS00247; HBGF.FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding;
KW 3D-structure.
FT PROPEP 1 155
FT CHAIN 10 155
FT SITE 46 48
FT SITE 88 90
FT BINDING 27 31
FT HEPARIN-BINDING GROWTH FACTOR 2.
FT CELL ATTACHMENT SITE (POTENTIAL).
FT CELL ATTACHMENT SITE (POTENTIAL).
FT HEPARIN (POTENTIAL).

MORF

(TM)

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
Run on: Tue Aug 29 16:10:45 2000; MasPar time 18.71 Seconds
bular output not generated. 778.223 Million cell updates/sec

Title: >US-09-121-017B-27
Description: (1-210) from US09121017B.pep
Perfect Score: 1522
Sequence: 1 MSGRAGRVQGTQLQALVFLGV.....PRTHYGOKAILFLPLPVSSD 210

Scoring table: PAM 150
Gap 11
Searched: 225878 seqs, 69334122 residues
Post-processing: Minimum Match 0%
Listing first 45 summaries
Database: sptrembl12
5:sp_invertebrate 2:sp_bacteria 3:sp_fungi 4:sp_human
5:sp_invertebrate 6:sp_mammal 7:sp_mhc 8:sp_organelle
9:sp_phase 10:sp_plant 11:sp_rodent 12:sp_unclassified
13:sp_invertebrate 14:sp_virus

Statistics: Mean 44.219; Variance 70.528; scale 0.627
Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES							
Result No.	Score	Match	Length	ID	Description	Pred. No.	
1	511	33.6	130	6	O77767	3.73e-95	
2	509	33.4	196	4	P78443	1.18e-94	
3	441	29.0	206	13	O9XGD8	1.49e-78	
4	382	25.1	101	13	P79706	2.16e-63	
5	346	22.7	146	13	O07659	9.89e-55	
6	336	22.1	196	13	O9TH31	2.39e-52	
7	313	20.6	115	11	O60487	6.64e-47	
8	301	19.8	194	6	P79150	4.35e-44	
9	296	19.4	212	13	O42407	6.41e-43	
10	274	18.0	252	11	O83096	8.07e-38	
11	265	17.4	60	4	Q16588	9.39e-36	
12	264	17.3	59	4	Q16089	1.59e-35	
13	264	17.3	70	11	O54837	1.59e-35	
14	257	16.9	243	13	Q9W6A1	6.28e-34	
15	251	16.5	127	4	O9Y517	1.44e-32	
16	248	16.3	192	4	O9S830	6.88e-32	
17	248	16.3	245	13	Q9W6A2	6.88e-32	
18	236	15.5	200	13	P79925	3.42e-29	
19	225	14.8	74	6	O77561	9.55e-27	
20	226	14.8	425	5	O76831	5.74e-27	

21	223	14.7	204	13	Q90696	FIBROBLAST GROWTH FACT	2.64e-26
22	222	14.6	210	13	O57341	FIBROBLAST GROWTH FACT	4.39e-26
23	217	14.3	770	5	P91672	FGF HOMOLOG	5.52e-25
24	213	14.0	244	4	Q14915	FIBROBLAST GROWTH FACT	4.14e-24
25	209	13.7	210	13	O42278	FIBROBLAST GROWTH FACT	3.08e-23
26	207	13.6	129	4	O60371	R33683_2	8.36e-23
27	199	13.1	285	14	O9YMH2	FIBROBLAST GROWTH FACT	4.44e-21
28	198	13.0	182	14	O92401	FGF-ACMNPV ORF32	7.27e-21
29	187	12.3	216	4	O95750	FGF-19	1.59e-18
30	183	12.0	73	6	O97573	FIBROBLAST GROWTH FACT	1.10e-17
31	181	11.9	114	4	O00527	BASIC FIBROBLAST GROWT	2.88e-17
32	181	11.9	114	4	Q16443	BASIC FIBROBLAST GROWT	2.88e-17
33	157	10.3	78	11	O35340	FIBROBLAST GROWTH FACT	2.31e-12
34	116	7.6	82	6	O62682	FIBROBLAST GROWTH FACT	1.19e-04
35	112	7.4	86	13	P79685	FIBROBLAST GROWTH FACT	5.81e-04
36	107	7.0	822	1	O27134	CONSERVED PROTEIN.	4.05e-03
37	103	6.8	1128	1	O51999	REPI PROTEIN.	1.84e-02
38	102	6.7	243	14	O73554	HYPOTHETICAL 27.5 KD P	2.67e-02
39	101	6.6	211	1	O9YEE7	211AA LONG HYPOTHETICA	3.87e-02
40	101	6.6	410	2	P72472	SENSOR PROTEIN HOMOLOG	3.87e-02
41	100	6.6	1128	1	O52009	REPI PROTEIN.	5.59e-02
42	95	6.2	109	1	Q9IEV4	109AA LONG HYPOTHETICA	3.38e-01
43	95	6.2	174	8	O34573	GORILLA MITOCHONDRIAL	3.38e-01
44	95	6.2	564	2	P94746	YHCK PROTEIN.	3.38e-01
45	95	6.2	569	2	P76330	FROM BASES 2019524 TO	3.38e-01

ALIGNMENTS

RESULT	1	PRELIMINARY;	PRT;	130	AA.
ID	O77767				
AC	O77767				
DT	01-NOV-1998 (TREMBLrel. 08, Created)				
DT	01-NOV-1998 (TREMBLrel. 08, Last sequence update)				
DT	01-NOV-1999 (TREMBLrel. 12, Last annotation update)				
DE	BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).				
GN	BFGF.				
OS	Canis familiaris (Dog).				
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;				
OC	Eutheria; Carnivora; Fissipedia; Canidae; Canis.				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RC	TISSUE-ADRENAL GLAND;				
RA	TROCHTA O.A.; JACOBS R.M.; LAMARRE J.;				
RT	"The role bFGF in canine Hemangiosarcoma."				
RL	Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.				
DR	EMBL; AF060562; AAC35912.1;				
DR	HSSP; P09038; 1BFF.				
DR	PROSITE; PS00247; HBGF_FGF; 1.				
DR	PFAM; PF00167; FGF; 1.				
FT	NON_TER 1				
FT	NON_TER 130				
FT	NON_TER 130				
SEQ	SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;				
Query Match 33.6%; Score 511; DB 6; Length 130;					
Best Local Similarity 55.3%; Pred No. 3.73e-95;					
Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;					
Db	1	FKDKRLKCKNGFFLRHPDGRVDGVREKSDPHVKLQLAERGVWSIKGVCI_ARYLAM	60		
Qy	78	YKKPKLLYCSNGGHFLRILPDGTVDGTRDSRQHLQLSAESVGVYIKSTE^GQYLAM	137		
Db	61	KEDGRLLASKVCVDECFERLENNNTYRSKYS--SWTVALKRFGQYKLPKTPGQ	118		
Qy	138	DTDGLLYGSOTPNCECLFLERLEENHYNTYISKKAENKFWGLKNGSKCRFPRTHYG	197		
Db	119	KAILFLPMSAKS 130			
Qy	198	KAILFLPLPVSS 209			
RESULT	2				
ID	P78443	PRELIMINARY;	PRT;	196	AA.

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
 RN [1]
 RX SEQUENCE FROM N.A.
 RA MEDLINE: 93246053.
 RA BORJA A.Z., ZELLER R., MEIJERS C.;
 RT "Expression of alternatively spliced bFGF first coding exons and
 RT antisense mRNAs during chicken embryogenesis.";
 RN Dev. Biol. 157:110-118(1993).
 RN [2]
 RP SEQUENCE OF 52-85 FROM N.A.
 RX MEDLINE: 90382254.
 RA MITRANI E., GROENBAUM Y., SHOHAT H., ZIV T.;
 RT "Fibroblast growth factor during mesoderm induction in the early chick
 RT embryo.";
 RN Development 109:387-393(1990).
 RL Development 109:387-393(1990).
 DR EMBL: M95706; AAA48616.1; -;
 DR EMBL: X56804; CAA40139.1; -;
 DR HSSP: P09038; 2BFH.
 DR PROSITE: PS00247; HBGF_FGF; 1.
 DR PFAM: PF00167; FGF; 1.
 DR PRINTS: PR00262; IL1HBGF.
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 22.7%; Score 346; DB 13; Length 146;
 Best Local Similarity 48.1%; Pred. No. 9.85e-55;
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERYSMVKIQLQAEERGVYSIKGSANRFLAMKEDGRLLALKATECFEERLESNNYN 104
 QY 106 DRSDQHIQLQSAESGEVYIKSTETGOYLANDTDGLYGSTPNECLFLERLEENHYN 165
 Db 105 TYRSRYSD--WVVALKRTGOYKPGPKTGQKAILFLPMSAKS 146
 QY 166 TYISKHAENWVGLKNGSCRGPRTHYQKAILFLPLVSS 209

RESULT 6
 ID Q9YH31 PRELIMINARY; PRT; 196 AA.
 AC Q9YH31;
 DT 01-MAY-1999 (TRENBLrel. 10, Created)
 DT 01-MAY-1999 (TRENBLrel. 10, Last sequence update)
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
 DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.
 OS Notophthalmus viridescens (Eastern newt) (Triturus viridescens).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia.
 OC Batrachia; Caudata; Salamandridae; Salamandridae; Notophthalmus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RA WEI Y.;
 RT "Putative Newt Fibroblast Growth Factor-4.";
 RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.
 DR EMBL: U76998; AAC98812.1; -;
 DR HSSP: P09038; 1BFF.
 DR PROSITE: PS00247; HBGF_FGF; 1.
 SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 22.1%; Score 336; DB 13; Length 196;
 Best Local Similarity 35.2%; Pred. No. 2.39e-52;
 Matches 69; Conservative 49; Mismatches 65; Indels 13; Gaps 9;

Db 10 ALLPVVLGLGLSLARCLPMPSPNGTL-E-WSWETLYSOSLARLAGGORTDAHRYGEVL 67
 QY 11 TLQALVFLGVLVGVWVPSAGARANGLLDSRGWGLLSRSRAGLAG-EISGVNWESGYL 69
 Db 68 LGIKRL----R-RL-XCNVIGFHLQVLPDGRIGHMSES-RYSLLISPVVERGVYCMFG 120
 QY 70 VGIKRQANKYKPKLLYCSNGHF-LRLIPDGTVDGTRDSQHIQLQSAESGEVYIKS 128
 Db 121 VQSGFLANMSKGRLFSGYFSECFKEMLLPNNTNAYESWYPM--YIALSKNGRAK 178
 QY 129 TETGOYLANDTDGLYGSTPNECLFLERLEENHYNHYISKHAENWVGLKNGSCK 188

Db 179 KGNKVSPTMTVTHFLP 194
 QY 189 RGRPRHYGQKAILFLP 204

RESULT 7
 ID Q60487 PRELIMINARY; PRT; 115 AA.
 AC Q60487;
 DT 01-NOV-1996 (TRENBLrel. 01, Created)
 DT 01-NOV-1996 (TRENBLrel. 01, Last sequence update)
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 OS Cavia porcellus (Guinea pig).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia.
 OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
 RN [1]
 RP SEQUENCE FROM N.A.
 RA TISSUE-PROSTATE;
 RA RICCIARDELLI C.;
 RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.
 DR EMBL: L75974; AAA85394.1; -;
 DR HSSP: P09038; 2BFH.
 DR PROSITE: PS00247; HBGF_FGF; 1.
 DR PFAM: PF00167; FGF; 1.
 DR NON_TER 1
 FT SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match 20.6%; Score 313; DB 11; Length 115;
 Best Local Similarity 44.6%; Pred. No. 6.64e-47;
 Matches 45; Conservative 22; Mismatches 37; Indels 3; Gaps 2;

Db 1 GFFLRHPDGRVDGVRKTDPHIKHFKPKA-EELCYOGLSNRYLAMKEDGRLLASKCV 59
 QY 90 GHFLRLPDGTVDGTRDSQHIQLQSAESGEVYIKSTETGOYLANDTDGLYGSTP 149
 Db 60 TDECFERLESNNYNTYRSKYS--SWYVALKRTGOYKLG 98
 QY 150 NEECLFLERLEENHYNTYISKHAENWVGLKNGSCKRG 190

RESULT 8
 ID P79150 PRELIMINARY; PRT; 194 AA.
 AC P79150;
 DT 01-MAY-1997 (TRENBLrel. 03, Created)
 DT 01-MAY-1997 (TRENBLrel. 03, Last sequence update)
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
 DE KERATINOCYTE GROWTH FACTOR.
 OS Canis familiaris (Dog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia.
 OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RA MEDLINE: 96226403.
 RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,
 RA BRUEGGEMEIER R.W., LIN Y.C.;
 RT "Keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine
 RT prostate: molecular cloning of mRNA encoding canine KGF.";
 RL DNA Cell Biol. 15:247-254(1996).
 DR EMBL: U08000; AAB38972.1; -;
 DR HSSP: P05230; 2AFG.
 DR PROSITE: PS00247; HBGF_FGF; 1.
 DR PFAM: PF00167; FGF; 1.
 DR PRINTS: PR00262; IL1HBGF.
 DR PRINTS: PR00263; HBGF_FGF.
 SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match 19.8%; Score 301; DB 6; Length 194;
 Best Local Similarity 38.6%; Pred. No. 4.35e-44;
 Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;

Db 69 LFCRTQ-WYLRIDKRGKVGTOEMKNSYNIMEIRVAVGIVAKGVESEYLLAMNKEGL 127
 QY 84 LYCSNGGHLRLPDGTVDGTRDSQHIQLQSAESGEVYIKSTETGOYLANDTDGL 143

RESULT	12	
ID	Q16089	PRELIMINARY;
AC	Q16089;	PRT; 59 AA.
DT	01-NOV-1996	(TRENBLrel. 01, Created)
DT	01-NOV-1996	(TRENBLrel. 01, Last sequence update)
DT	01-NOV-1999	(TRENBLrel. 12, Last annotation update)
DE	ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).	
OS	Homo sapiens (Human).	
OC	Eukaryota;	Chordata; Craniata; Vertebrata; Mammalia;
OC	Eutheria;	Metazoa;
OC	Eutheria;	Primates; Catarrhini; Hominiidae; Homo.

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DR PROSITE: PS00247; HBGF_FGF; 1.
SQ SEQUENCE 243 AA; 27455 MW; A9E6E8CD CRC32;

Query Match 16.9%; Score 257; DB 13; Length 243;
Best Local Similarity 34.4%; Pred. No. 6,28e-34;
Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps 3;

Db 77 LF-SQGYIFLOMHPDGTIDGTKDENSDFTLNLPVGLRVVAIQGVKAGLYVAMNAGEYL 135
QY 84 LYCSNGGHFLRILPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOYLAMDYDGLL 143
Db 136 YSSDVTTPCKFKESVFENYVYVSTLVRQESGRAWFLGKNGEQIMKGNRVKTKPS 195
QY 144 YGSQTNEECFLERLEENHNTYISK--KHAE--KNWFGVLKNGSKRGPRRTHYGOKA 199
Db 196 SHEVPKPI 203
QY 200 ILFLPLP 207

RESULT 15
ID Q99517 PRELIMINARY; PRT; 127 AA.
AC Q99517:
DT 01-MAY-1997 (TrEMBLrel. 03, Created)
DT 01-MAY-1997 (TrEMBLrel. 03, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).
DE FGF12.
GN FGF12.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominiidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RA COULLER F., PONTAROTTI P., ROUBIN R., HARTUNG H., GOLDFARB M.,
RA BIRNBAUM D.;
RL J. Mol. Evol. 0:0-0(0).
RL EMBL; 270276; CAA94240.1; -.
DR HSSP; P03968; 1AFC.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1
FT NON_TER 127
SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 16.5%; Score 251; DB 4; Length 127;
Best Local Similarity 34.6%; Pred. No. 1.44e-32;
Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps 3;

Db 2 LF-SQGYIFLOMHPDGTIDGTKDENSDFTLNLPVGLRVVAIQGVKASLYVAMNAGEYL 60
QY 84 LYCSNGGHFLRILPDGTVDRSDQHQLQLSAESVGEVYIKSTETGOYLAMDYDGLL 143
Db 61 YSSDVTTPCKFKESVFENYVYVSTLVRQESGRAWFLGKNGEQIMKGNRVKTKPS 120
QY 144 YGSQTNEECFLERLEENHNTYISK--KHAE--KNWFGVLKNGSKRGPRRTHYGOKA 199
Db 121 SHEVPKPI 127
QY 200 ILFLPLP 206

Search completed: Tue Aug 29 16:11:48 2000
Job time : 63 secs.

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W P S R L A (TM)

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MPSrch_pp protein - protein database search, using Smith-Waterman algorithm

Run on: Tue Aug 29 16:17:48 2000; MasPar time 6.90 Seconds
617.879 Million cell updates/sec
Linear output not generated.

Title: >US-09-121-017B-29
Description: (1-180) from US09121017B.pap
Perfect Score: 1294
Sequence: 1 MSGRAGRVOGTLQALVFLGV.....PRTHYGQKAILFLPLPVSSD 180

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: a-geneseq36
1:geneseqp

Statistics: Mean 31.434; Variance 127.797; scale 0.246

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	931	71.9	140	1	R25914 Human acidic fibroblasts	1.80e-82
2	931	71.9	140	1	R34497 Human acidic fibroblasts	1.80e-82
3	931	71.9	140	1	P90068 Human acid fibroblast	1.80e-82
4	931	71.9	140	1	R74647 Human recombinant aFGF	1.80e-82
5	931	71.9	140	1	W04806 Human acidic fibroblasts	1.80e-82
6	931	71.9	140	1	P70995 Sequence of human prot	1.80e-82
7	931	71.9	141	1	R10527 Human acid fibroblasts	1.80e-82
8	931	71.9	151	1	R05789 Human aFGF encoded by	1.80e-82
9	931	71.9	154	1	W92283 Human beta-endothelial	1.80e-82
10	931	71.9	154	1	W04805 Human beta-endothelial	1.80e-82
11	931	71.9	154	1	W06816 Human endothelial cell	1.80e-82
12	931	71.9	154	1	W75414 Human beta-endothelial	1.80e-82
13	931	71.9	155	1	P94037 Human acidic fibroblasts	1.80e-82
14	931	71.9	155	1	R70812 FGF-1.	1.80e-82
15	931	71.9	155	1	P70482 Sequence encoded by co	1.80e-82
16	931	71.9	155	1	R80776 Fibroblast growth fact	1.80e-82
17	931	71.9	155	1	W53022 Fibroblast growth fact	1.80e-82
18	931	71.9	155	1	W75711 Fibroblast growth fact	1.80e-82
19	931	71.9	155	1	W75415 Human endothelial cell	1.80e-82
20	931	71.9	155	1	W92291 Human endothelial cell	1.80e-82
21	931	71.9	165	1	R05785 Human BECGF encoded by	1.80e-82
22	931	71.9	168	1	W06818 Human endothelial cell	1.80e-82
23	928	71.7	134	1	W75413 Human alpha-endothelia	3.68e-82

24	928	71.7	134	1	W92282 Human alpha-endothelia	3.68e-82
25	928	71.7	134	1	W04807 Human alpha-endothelia	3.68e-82
26	920	71.1	156	1	W71383 Fibroblast growth fact	2.48e-81
27	917	70.9	135	1	W06817 Human endothelial cell	5.08e-81
28	906	70.0	155	1	R25570 Recombinant human Ala1	7.01e-80
29	906	70.0	155	1	W00561 Human (Gly93) aFGF ana	7.01e-80
30	905	69.9	132	1	R11327 9 N-terminal residue d	8.90e-80
31	905	69.9	132	1	R25418 aFGF mutain #2.	8.90e-80
32	895	69.2	140	1	R65935 Fibroblast growth fact	9.66e-79
33	883	68.2	129	1	R25419 aFGF mutain #3.	1.69e-77
34	883	68.2	129	1	R11328 12 N-terminal residue	1.69e-77
35	868	67.1	154	1	R05315 Human acidic fibroblas	6.03e-76
36	862	66.6	140	1	P90069 Bovine acidic fibrobla	2.52e-75
37	862	66.6	140	1	R74648 Bovine recombinant aFG	2.52e-75
38	862	66.6	140	1	R13030 Brain-derived acidic f	2.52e-75
39	862	66.6	140	1	R55934 Bovine fibroblast grow	2.52e-75
40	862	66.6	140	1	R34496 Bovine acid fibrobla	2.52e-75
41	862	66.6	140	1	R25915 Human acid fibroblas	2.52e-75
42	862	66.6	154	1	P90074 Recombinant human muta	2.52e-75
43	857	66.2	141	1	R25569 Recombinant bovine Ala	8.28e-75
44	857	66.2	141	1	W00560 Bovine (Ala47,Gly93) a	8.28e-75
45	845	65.3	136	1	W01747 Chimeric acid/basic fi	1.44e-73

ALIGNMENTS

RESULT 1
ID R25914 standard; peptide; 140 AA.
AC R25914;
DE Human acidic fibroblast growth factor.
KW herpes simplex virus; HSV-1; HSV-2;
KW herpes varicella; herpes zoster; cytomegalovirus; Influenza;
KW human respiratory syncytial virus; Semliki Forest virus; HIV;
KW human immunodeficiency virus; Moloney Sarcoma virus.
OS Homo sapiens.
PN EP-497341-A.
PD 05-AUG-1992.
PF 30-JAN-1992; 101541.
PR 31-JAN-1991; GB-002145.
PR 09-JAN-1992; GB-000410.
PA (FARM) FARMITALIA ERBA SRL CARLO.
PI Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;
DR WPI: 92-260792/32.
PT Synergistic antiviral composition contains BFGF and sulphated
PT polysaccharide - for treating viral infections e.g. HSV-1 and -2,
PT cytomegalovirus, HIV, influenza virus etc.
PS Disclosure; Page 4; 20pp; English.
CC This sequence represents acidic fibroblast growth factor (aFGF).
CC aFGF, or its fragments may be used in a synergistic compsn. with an
CC antivirally active sulphated polysaccharide, and one or more
CC excipients. The compsn. may be used to control herpes simplex virus
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;
CC human respiratory syncytial virus; Semliki Forest virus; HIV or
CC Moloney Sarcoma virus. The combination of aFGF with sulphated
CC polysaccharide is found to have a greater antiviral activity than
CC expected for an additive effect. See also R25913-5.
SQ Sequence 140 AA;

Query Match	71.9%;	Score 931;	DB 1;	Length 140;
Best Local Similarity	94.4%;	Pred. No. 1.80e-82;		
Matches	135;	Conservative	1;	Mismatches
			2;	Indels
			5;	Gaps
1;				
Db	3	LPPONYKKPLLYCSNGHFLRILPDGTGTRDRSDQHILQLSAESVGVYIKSTETG	62	
Qy	38	LLDANYKKPLLYCSNGHFLRILPDGTGTRDRSDQHILQLSAESVGVYIKSTETG	97	
Db	63	QYLAMDYDGLLYGSGTNEECFLERLEEN-----HNTYISKHAEKNWFVGLKNGSC	117	
Qy	98	QYLAMDYDGLLYGSGTNEECFLERLEENATPATPHYNTYISKHAEKNWFVGLKNGSC	157	
Db	118	KRGPRTHYGOKAILFLPLPVSSD	140	

QY 158 KRGRTHYGOKAILFLPLPVSSD 180

RESULT 2

ID R34497; standard; protein; 140 AA.
 AC R34497;
 DE Human acidic fibroblast growth factor.
 DE aFGF; mutagen; glycosylation site; glycoprotein.
 KW Homo sapiens.
 OS Homo sapiens.
 PN J05076356-A.
 PD 30-MAY-1991; 127435.
 PR 31-MAY-1990; JP-143388.
 PA (TAKE) TAKEDA CHEM IND LTD.
 DR WPI; 93-139564/17.
 PT FGF mutagen prep. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF mutagen.
 PT Disclosure; Page 3: 23pp; Japanese.
 CC The invention covers mutants of FGF (esp. bFGF) which contain at least one glycosylation site. The mutants can be used to treat burns and thrombosis.
 SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 62
 | : |||||
 QY 38 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKAENKWFVGLKKNKSC 117
 | : |||||
 Db 63 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKAENKWFVGLKKNKSC 117
 | : |||||
 QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKAENKWFVGLKKNKSC 157
 | : |||||
 Db 118 KRGRTHYGOKAILFLPLPVSSD 140
 | : |||||
 QY 158 KRGRTHYGOKAILFLPLPVSSD 180
 | : |||||

RESULT 3

ID P90068 standard; protein; 140 AA.
 AC P90068;
 DE Human acid fibroblast growth factor
 DE Human acidic fibroblast growth factor; mutant.
 KW Homo sapiens
 OS Homo sapiens
 PN EP-319052-A.
 PD 14-JUN-1989.
 PR 14-OCT-1988; 202306.
 PR 22-OCT-1987; EP-244431.
 PA (MERI) Merck and Co.
 PI Thomas Jnr KA, Linemeyer DL;
 DR WPI; 89-167092/23.
 PT Mutant acidic fibroblast growth factor
 PT ~ used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.
 PT Disclosure; page 4; 36pp; English.
 CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.
 SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 62
 | : |||||

QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97
 | : |||||
 Db 63 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKAENKWFVGLKKNKSC 117
 | : |||||
 QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKAENKWFVGLKKNKSC 157
 | : |||||
 Db 118 KRGRTHYGOKAILFLPLPVSSD 140
 | : |||||
 QY 158 KRGRTHYGOKAILFLPLPVSSD 180
 | : |||||

RESULT 4

ID R74647 standard; protein; 140 AA.
 AC R74647;
 DE Human recombinant aFGF.
 DE Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis;
 KW mitogen.
 OS Homo sapiens.
 PN US5401832-A.
 PD 28-MAR-1995.
 PR 24-DEC-1984; US-685923.
 PR 12-SEP-1985; US-774359.
 PR 30-MAY-1986; US-868473.
 PR 11-JUL-1986; US-884460.
 PR 04-JUN-1987; US-054991.
 PR 04-MAY-1988; US-190293.
 PR 08-FEB-1991; US-654397.
 PR 25-SEP-1991; US-765472.
 PR 25-SEP-1992; US-951365.
 PA (MERI) MERCK & CO INC.
 PI Ginez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;
 PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair
 PT Claim 2: Column 30: 25pp; English.
 CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in 088233) incorporating codons preferred by E. coli or mammalian cells, unique cloning sites, etc. This synthetic gene was mutagenized to obtain a gene encoding a human recombinant aFGF (R74647) having activity equivalent to the native protein.
 SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 62
 | : |||||
 QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97
 | : |||||
 Db 63 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKAENKWFVGLKKNKSC 117
 | : |||||
 QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKAENKWFVGLKKNKSC 157
 | : |||||
 Db 118 KRGRTHYGOKAILFLPLPVSSD 140
 | : |||||
 QY 158 KRGRTHYGOKAILFLPLPVSSD 180
 | : |||||

RESULT 5

ID W04806 standard; protein; 140 AA.
 AC W04806;
 DE Human acidic fibroblast growth factor.
 DE Endothelial cell affinity factor; ECGF; blood vessel; regeneration;
 KW Heparin-Sepharose affinity chromatography; probe; oligonucleotide;
 KW FGF; fibroblast growth factor; ss.
 OS Homo sapiens.

RESULT 5

ID W04806 standard; protein; 140 AA.
 AC W04806;
 DE Human acidic fibroblast growth factor.
 DE Endothelial cell affinity factor; ECGF; blood vessel; regeneration;
 KW Heparin-Sepharose affinity chromatography; probe; oligonucleotide;
 KW FGF; fibroblast growth factor; ss.
 OS Homo sapiens.

PN US5552528-A.
 PD 03-SEP-1996.
 PF 03-MAR-1986; 835594.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PA (RHON) RHONE POULENC RORER PHARM INC.
 PI Burgess W, Maciag T;
 DR WPI: 96-412132/41.
 DR N-PSDB; T37503
 PT Isolated, purified, biologically active bovine beta endothelial cell
 PT growth factor - useful to regenerate or treat damaged blood vessels
 PS Disclosure; Fig 8; 28pp; English.
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
 CC brain using heparin-Sepharose affinity chromatography. ECGF is
 CC useful for, among other purposes, diagnostic applications and has
 CC potential in the treatment of damaged blood vessels or other
 CC endothelial cell-lined structures.
 CC Human ECGF (T37503) or fragments may be obtained using
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
 CC on the sequence of bovine alpha- and beta-ECGF.
 SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEYIKSTETG 62
 | : |||||
 QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEYIKSTETG 97
 | : |||||

Db 63 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKHAENWVGLKKNKGC 117
 | : |||||
 QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKHAENWVGLKKNKGC 157
 | : |||||

Db 118 KRGRPRTHYGOKAILFLPLPVSSD 140
 | : |||||
 QY 158 KRGRPRTHYGOKAILFLPLPVSSD 180
 | : |||||

RESULT 6
 ID P70995 standard; protein; 140 AA.
 AC P70995;
 DT 13-JUN-1991 (first entry)
 DE Sequence of human proteinaceous factor (PFI) with mitogenic activity.
 DE Cell growth promoter; mitogen; vascularisation; wound healing.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT misc_difference 140 /label= Asp-OH
 FT EP-241136-A.
 PN 14-OCT-1987.
 PF 06-MAR-1987; 301969.
 PR 07-MAR-1986; US-838096.
 PA (HARD) HARVARD COLLEGE.
 PI Lobb RR, Harper JW, Strydom DJ;
 DR WPI: 87-285995/41.
 DR Mitogenic polypeptide isolated from human brain tissue - useful
 PT for increasing vascular effect in eg wound healing, or
 PT generating endothelial cell linings for vascular prostheses, etc.
 PT Claim 3; Page 1; 31pp; English.
 CC The PF of the invention was obt'd. from human brain tissue. It has a
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
 CC affinity for heparin. PFI and fragments are useful for promoting the
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
 CC generating endothelial cell linings for vascular prostheses (all
 CC claimed). The polypeptides are useful for increasing vascularisation.
 SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEYIKSTETG 62
 | : |||||
 QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEYIKSTETG 97
 | : |||||

Db 63 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKHAENWVGLKKNKGC 117
 | : |||||
 QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKHAENWVGLKKNKGC 157
 | : |||||

Db 118 KRGRPRTHYGOKAILFLPLPVSSD 140
 | : |||||
 QY 158 KRGRPRTHYGOKAILFLPLPVSSD 180
 | : |||||

RESULT 7
 ID R10527 standard; Protein; 141 AA.
 AC R10527;
 DT 15-APR-1991 (first entry)
 DE Human acidic fibroblast growth factor gene.
 DE aFGF; antibody; antigen; cancer; ss.
 OS Homo sapiens.
 FH Key Location/Qualifiers
 FT region 2..12
 FT /label= A
 FT region 56..67
 FT /label= B
 FT region 104..114
 FT /label= C
 FT region 132..141
 FT /label= D
 PN J02306996-A.
 PD 20-DEC-1990.
 PF 03-JUL-1989; 172542.
 PR 04-JUL-1988; JP-166275.
 PR 03-JUL-1989; JP-172542.
 PA (TAKE) TAKEDA CHEMICAL IND KK.
 DR WPI: 91-040150/06.
 DR N-PSDB; Q10399.
 DR Anti-acid antibody, for cancer diagnosis, etc. - is obt'd. by
 PT using complex of partial peptide(s) of acid fibroblast growth
 PT factor and protein as antigen.
 PS Disclosure; Fig 1; 19pp; Japanese.
 CC Peptides derived from a gene used to produce recombinant aFGF.
 CC Antigens to produce anti-aFGF antibodies. The peptides must
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
 CC (claim 8). The AAs can be used for immunochemically measuring aFGF,
 CC and for purifying aFGF. They are useful as reagents in the diag-
 CC nosis of various cancers or diseases of the CNS. Purified aFGF
 CC has wound healing and nerve cell proliferating properties.
 SQ Sequence 141 AA;

Query Match 71.9%; Score 931; DB 1; Length 141;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 4 LPPGNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEYIKSTETG 63
 | : |||||
 QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEYIKSTETG 97
 | : |||||

Db 64 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKHAENWVGLKKNKGC 118
 | : |||||
 QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKHAENWVGLKKNKGC 157
 | : |||||

Db 119 KRGRPRTHYGOKAILFLPLPVSSD 141
 | : |||||
 QY 158 KRGRPRTHYGOKAILFLPLPVSSD 180
 | : |||||

RESULT 8

QY 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
 Db 77 QYLANDTDGLLYGSOTPNNECLFLERLEEN-----HNTYISKHAEKNWVGLKKNKNGSC 131
 QY 98 QYLANDTDGLLYGSOTPNNECLFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157
 Db 132 KRGRTHYQKAILFLPLPVSSD 154
 QY 158 KRGRTHYQKAILFLPLPVSSD 180

RESULT 11
 ID W06816 standard; Protein; 154 AA.
 AC W06816;
 DT 17-MAR-1997 (first entry)
 DE Human endothelial cell growth factor-beta.
 KW Endothelial cell growth factor-beta; ECGF-beta.
 OS Homo sapiens.
 PN US5571790-A.
 PR 05-NOV-1996.
 PR 03-MAR-1986; 835594.
 PR 18-DEC-1987; US-835594.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 96-505421/50.
 PT Recombinant human endothelial cell growth factors - for treating
 PT damaged blood vessels, etc.
 PS Claim 1; Column 16; 22pp; English.
 CC Human recombinant endothelial cell growth factors (ECGF) beta
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
 CC They can be produced in transformed prokaryotic or eukaryotic host
 CC cells using DNA sequences (T45983 and T45984, respectively) derived
 CC from the complete human ECGF cDNA (T45985). Large quantities of
 CC the ECGFs are produced by culturing the host cells and recovering
 CC the proteins. ECGFs have utility in the growth and amplification
 CC of endothelial cells in culture. They can potentially be used to
 CC treat damaged blood vessels and other endothelial cell-lined
 CC structures, and also have diagnostic applns.
 SQ Sequence 154 AA;

Query Match 71.9%; Score 931; DB 1; Length 154;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

QY 17 LPPGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76
 Db 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
 Db 77 QYLANDTDGLLYGSOTPNNECLFLERLEEN-----HNTYISKHAEKNWVGLKKNKNGSC 131
 QY 98 QYLANDTDGLLYGSOTPNNECLFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157
 Db 132 KRGRTHYQKAILFLPLPVSSD 154
 QY 158 KRGRTHYQKAILFLPLPVSSD 180

RESULT 12
 ID W75414 standard; Protein; 154 AA.
 AC W75414;
 DT 02-MAR-1999 (first entry)
 DE Human beta-endothelial cell growth factor.
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
 KW hybridisation; bovine; wound healing; prosthetic device.
 OS Homo sapiens.
 PN US5827826-A.
 PR 27-OCT-1998.

Query Match 71.9%; Score 931; DB 1; Length 154;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

PF 04-NOV-1996; 743261.
 PR 04-NOV-1996; US-743261.
 PR 03-MAR-1986; US-835594.
 PR 18-DEC-1987; US-134499.
 PR 29-APR-1991; US-693079.
 PR 27-NOV-1991; US-799859.
 PR 03-NOV-1994; US-334884.
 PR 07-JUN-1995; US-472964.
 PA (RHON) RHONE-POULENC RORER PHARM INC.
 PI Burgess W, Drohan WN, Jaye M, Maciag T;
 DR WPI; 98-594032/50.
 PT Compositions for promoting wound healing - containing endothelial
 PT cell growth factor polypeptides
 PS Claim 1; Column 16; 23pp; English.
 CC This sequence represents the amino acid sequence of the mature human
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
 CC is identical to the alpha-ECGF but the beta sequence contains an extra
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain
 CC stem cell cDNA library using a probe designed based on fragments of the
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
 CC compositions for promoting wound healing. ECGF is also used to grow
 CC cells on a prosthetic device.
 SQ Sequence 154 AA;

Query Match 71.9%; Score 931; DB 1; Length 154;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 17 LPPGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76
 QY 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
 Db 77 QYLANDTDGLLYGSOTPNNECLFLERLEEN-----HNTYISKHAEKNWVGLKKNKNGSC 131
 QY 98 QYLANDTDGLLYGSOTPNNECLFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157
 Db 132 KRGRTHYQKAILFLPLPVSSD 154
 QY 158 KRGRTHYQKAILFLPLPVSSD 180

RESULT 13
 ID P94037 standard; Protein; 155 AA.
 AC P94037;
 DT 25-JUN-1990 (first entry)
 DE Human acidic fibroblast growth factor.
 KW Acidic fibroblast growth factor.
 OS Homo sapiens.
 PN EP-298723-A.
 PD 11-JAN-1989.
 PR 06-JUL-1988; 306158.
 PR 07-JUL-1987; US-070797.
 PA (BIOT-) Biotech Res Assoc.
 PI Fiddes JC, Abraham JA, Protter A;
 DR WPI; 89-009785/02.
 DR N-PSDB; N93088.
 PT Recombinant DNA encoding new fibroblast growth factor
 PT analogues - useful eg for accelerating wound healing and
 PT to control neovascularisation.
 PS Disclosure; p; English.
 CC See also P94038.
 SQ Sequence 155 AA;

Query Match 71.9%; Score 931; DB 1; Length 155;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 77
 QY 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
 Db 78 QYLANDTDGLLYGSOTPNNECLFLERLEEN-----HNTYISKHAEKNWVGLKKNKNGSC 132
 QY 98 QYLANDTDGLLYGSOTPNNECLFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157

QY 98 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 157
 Db 133 KRGRPTHYGGKAILFLPLPVSSD 155
 QY 158 KRGRPTHYGGKAILFLPLPVSSD 180

RESULT 14

ID R70812 standard; protein; 155 AA.
 AC R70812;
 DT 01-SEP-1995 (first entry)
 DE FGF-1.
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
 OS saparin; cytostatic; tumor; diabetes; rheumatoid arthritis.
 FS homo sapiens.
 FH key Location/Qualifiers
 FT misc_difference 31
 FT misc_difference 132 /note= "Cys may be replaced by Ser"
 FT misc_difference 132 /note= "Cys may be replaced by Ser"
 WO9503831-A.
 PD 09-FEB-1995.
 PF 27-JUL-1994; U08511.
 PR 02-AUG-1993; US-099924.
 PR 29-OCT-1993; US-145829.
 PA (PRIZ-) PRIZM PHARM INC.
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
 PI Baird AJ, Lappi DA, Sosnowski BA;
 DR WPI; 95-082038/11.
 PT New monogenic preparations of cytotoxic conjugates and DNA -
 PT contain fibroblast growth factors and cytotoxic agents for
 PT treating FGF conditions such as tumors, diabetes and rheumatoid
 PT arthritis.
 PS Disclosure; Page 108-109; 128pp; English.
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
 CC by conservative Ser substitutions. The fusion proteins are potent
 CC cytotoxic agents to cells bearing the FGF receptor.
 CC Sequence 155 AA;
 SQ

Query Match 71.9%; Score 931; DB 1; Length 155;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETG 77
 | :|||||
 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETG 97
 | :|||||
 Db 78 QYLANDTDGLLYGSGTNEECFLERLEEN-----HYNTYISKHAEKNWFVGLKKNKGC 132
 | :|||||
 QY 98 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 157

RESULT 15

ID P70482 standard; Protein; 155 AA.
 AC P70482;
 DT 13-MAY-1991 (first entry)
 DE Sequence encoded by complete cDNA sequence of human endothelial
 DE cell growth factor (ECGF).
 KW Endothelial cell regeneration; blood vessel regeneration.
 OS Homo sapiens.
 FH key Location/Qualifiers
 FT protein 2..15
 FT /label= Beta ECGF
 FT protein 16..21
 FT /label= Acidic FGF
 FT protein 22..155
 FT /label= Alpha ECGF

PN WO8705332-A.
 PD 11-SEP-1987.
 PF 02-MAR-1987; U00425.
 PR 03-MAR-1986; US-835594.
 PR 26-MAR-1987; ES-000812.
 PA (MELO-) MELOY LAB INC.
 PA (RORE-) RORER BIOTECHN INC.
 PA (RORE-) RORER.
 PA BIOTECH INC.
 PI Jaye M, Burgess W, Maciag T, Drohan W;
 DR WPI; 87-264128/37.
 DR N-PSDB; N70788
 DT Human endothelial cell growth factor - produced by recombinant
 PT DNA techniques, useful for wound healing
 PS Example; Fig 8; 43pp; English.
 CC To screen the human brain stem cDNA library for clones contg. ECGF
 CC inserts, a specific oligonucleotide was designed. This
 CC oligonucleotide was based upon a partial AA sequence analysis of
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
 CC forth for comparison the AA sequence of cyanogen bromide-cleaved
 CC bovine alpha and beta ECGF (P70834). The two clones that were
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
 CC nucleotide sequence of these clones and the AA sequence deduced from
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
 SQ Sequence 155 AA;

Query Match 71.9%; Score 931; DB 1; Length 155;
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;
 Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETG 77
 | :|||||
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETG 97
 | :|||||
 Db 78 QYLANDTDGLLYGSGTNEECFLERLEEN-----HYNTYISKHAEKNWFVGLKKNKGC 132
 | :|||||
 QY 98 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 157
 | :|||||
 Db 133 KRGRPTHYGGKAILFLPLPVSSD 155
 | :|||||
 QY 158 KRGRPTHYGGKAILFLPLPVSSD 180

Search completed: Tue Aug 29 16:18:04 2000
 Job time : 16 secs.

(TM)

MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
 on: Tue Aug 29 16:17:11 2000; MasPar time 11.21 Seconds
 757.271 Million cell updates/sec
 Regular output not generated.

Scoring table: PAM 150
Gap 11

```
Database:
pir64
1:pir1 2:pir2 3:pir3 4:pir4
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Result No.	Score	Query Match	Length	DB ID	Description	Pred. No.
1	931	71.9	155	1	acidic fibroblast gro	2.21e-185
2	914	70.6	155	1	acroic fibroblast gro	2.38e-181
3	911	70.4	155	2	D37360	1.23e-180
4	911	70.4	155	2	acidic fibroblast gro	1.23e-180
5	900	69.6	152	2	SO4147	4.95e-178
6	862	66.6	155	1	GK80A	4.87e-169
7	851	66.5	155	2	A60130	8.40e-169
8	851	65.8	155	2	JW0055	1.94e-166
9	475	36.7	189	2	A48834	4.56e-79
10	469	36.2	157	1	GK80B	1.04e-77
11	462	35.7	146	1	S00185	4.00e-76
12	462	35.7	210	2	D32398	4.00e-76
13	458	35.4	154	2	A31674	3.21e-75
14	453	35.0	154	2	C37360	4.31e-74
15	450	34.8	164	2	S31622	2.05e-73
16	438	33.8	155	1	A40117	1.03e-70
17	418	32.3	137	2	I46711	3.16e-66
18	346	24.4	208	2	A48137	9.00e-44
19	316	24.4	208	2	S6486	9.00e-44
20	298	23.0	207	2	JC5941	6.64e-40
21	293	22.6	207	2	JC5940	7.76e-39
22	280	21.6	202	2	S14192	4.49e-36
23	267	20.6	60	2	JH0708	2.47e-33

#authors Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal Oncogene (1990) 5:755-762
#title Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession M43804
#molecule_type mRNA
#residues 1-155 #label CHI
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE A24662
#authors Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.; Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.; Drohan, W.N.
#journal Science (1986) 233:541-545
#title Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.
#cross-references MUID:86261805
#accession A24662
#molecule_type mRNA
#residues 1-155 #label JAY
#cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE JH0707
#authors Yu, Y.L.; Kha, H.; Golden, J.A.; Migchelsen, A.A.J.; Goetzl, E.J.; Turck, C.W.
#journal J. Exp. Med. (1992) 175:1073-1080
#title An acidic fibroblast growth factor protein generated by alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession JH0707
#molecule_type mRNA
#residues 1-155 #label YUY
#cross-references GB:X65778; NID:g396163; PIDN:CAA45661.1; PID:g396164
REFERENCE S35535
#authors Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris, S.E.; Myers, R.L.; Chiu, I.M.
#journal Nucleic Acids Res. (1993) 21:489-495
#title Cloning of two novel forms of human acidic fibroblast growth factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession S35535
#status translation not shown
#molecule_type mRNA
#residues 1-58 #label PAY
#cross-references GB:L01485
#accession S35536
#status translation not shown
#molecule_type mRNA
#residues 1-58 #label PA2
#cross-references GB:L01487
REFERENCE I39412
#authors Crumley, G.; Dionne, C.A.; Jaye, M.
#journal Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title The gene for human acidic fibroblast growth factor encodes two upstream exons alternatively spliced to the first coding exon.
#cross-references MUID:90365758
#accession I39413
#status translation not shown
#molecule_type mRNA
#residues 1-40 #label RES
#cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170; GB:M60516; NID:g178232; PID:g553171
REFERENCE A23553
#authors Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession A23553
#molecule_type protein
#residues 16-155 #label HAR
REFERENCE A24820
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title The complete amino acid sequence of human brain-derived

acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession A24820
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE A90122
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities.
#cross-references MUID:86186784
#accession A24243
#molecule_type protein
#residues 16-47 #label G12
#experimental_source brain
REFERENCE A91364
#authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors.
#cross-references MUID:86275260
#accession A24301
#molecule_type protein
#residues 16-30,'X',32-49 #label GAU
REFERENCE A26386
#authors Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession A26386
#molecule_type protein
#residues 16-155 #label GA2
#experimental_source brain
REFERENCE A53639
#authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.; Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.; Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
#molecule_type protein
#residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',133-140,'X',142-152 #label CHA
GENETICS
#gene GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
16-155 #product fibroblast growth factor 1 #status experimental
#label MATN
129 #binding-site carbohydrate (Asn) (covalent) #status absent
SUMMARY
#length 155 #molecular-weight 17460 #checksum 9243
Query Match 71.9%; Score 931; DB 1; Length 155;
Best Local Similarity 94.4%; Pred. No. 2.21e-185;
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNKPKLLYCSNGGHFLRILPDGVGTRDSQHQIQLSAESVGEYVIRKSTEG 77
| :|||||
Qy 38 LLDANYKKPKLLYCSNGGHFLRILPDGVGTRDSQHQIQLSAESVGEYVIRKSTEG 97
| :|||||
Db 78 QYLANDTGLLYGSGTNPNECLFLERLEEN-----HYNTYISKKAENKWNFVGLKNGSC 132
| :|||||
Qy 98 QYLANDTGLLYGSGTNPNECLFLERLEENATPPAPHYNTYISKKAENKWNFVGLKNGSC 157
| :|||||


```
Db 133 KRGPRTYHGOKAILFLPLPVSSD 155
|||||
QY 158 KRGPRTYHGOKAILFLPLPVSSD 180

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-I gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 70.68; Score 914; DB 1; Length 155;
Best Local Similarity 92.3%; Pred. No. 2.38e-181;
Matches 132; Conservative 2; Mismatches 4; Indels 5; Gaps 1;

Db 18 LPGNKPKLLYCSNGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTGTG 77
| : |||||
QY 38 LDANYPKPKLLYCSNGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKSTETG 97
| : |||||

Db 78 QYLANDTGLLYGSQTPNEECFLERLEEN-----HYNTYTSKKHAEKNWFVGLKNGSKC 132
|||||
QY 98 QYLANDTGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSKC 157
|||||

Db 133 KRGPRTYHGOKAILFLPLPVSSD 155
|||||
QY 158 KRGPRTYHGOKAILFLPLPVSSD 180

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:G193284; PIDN:AAA37618.1; PID:G309236
REFERENCE JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
```

```
##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
disease including atherosclerosis, cancer and inflammatory
autoimmune disease.
```

GENETICS

```
#gene Fgf-1
#introns 57/1; 91/3
#superfamily fibroblast growth factor
CLASSIFICATION #length 155 #molecular-weight 17417 #checksum 9341
SUMMARY

Query Match 70.4%; Score 911; DB 2; Length 155;
Best Local Similarity 92.9%; Pred. No. 1.23e-180;
Matches 130; Conservative 3; Mismatches 2; Indels 5; Gaps 1;

Db 21 GNYKPKLLYCSNGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTGTGQYL 80
| : |||||
QY 41 ANYKPKLLYCSNGHFLRLPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 100
| : |||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEEN-----HYNTYTSKKHAEKNWFVGLKNGSKCRG 135
|||||
QY 101 AMDTGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSKCRG 160
|||||

Db 136 PRTHYGQKAILFLPLPVSSD 155
|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.-C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:G56351; PIDN:CAA32448.1; PID:G56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 70.4%; Score 911; DB 2; Length 155;
Best Local Similarity 92.9%; Pred. No. 1.23e-180;
Matches 130; Conservative 3; Mismatches 2; Indels 5; Gaps 1;

Db 21 GNYKPKLLYCSNGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTGTGQYL 80
| : |||||
QY 41 ANYKPKLLYCSNGHFLRLPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 100
| : |||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEEN-----HYNTYTSKKHAEKNWFVGLKNGSKCRG 135
|||||
QY 101 AMDTGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSKCRG 160
|||||

Db 136 PRTHYGQKAILFLPLPVSSD 155
|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
```

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16-Jul-1999
JH0476; S20072
ACCESSIONS
REFERENCE
JH0476
#authors
Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal
Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title
Amplification and sequencing of mRNA encoding acidic
fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note
the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28
133
#region nuclear location signal\
#binding_site heparin (Lys) #status predicted
#length 152 #checksum 1124
SUMMARY
Query Match 69.6%; Score 900; DB 2; Length 152;
Best Local Similarity 92.1%; Pred. No. 4.95e-178;
Matches 129; Conservative 2; Mismatches 4; Indels 5; Gaps 1;
Db 18 LPQGNKPKLLYCSNGGHFRLIPDGTGTRDRSDQHIOQLSASVGVYIKSTETG 77
I :|||||
Qy 38 LLDANKPKLLYCSNGGHFRLIPDGTGTRDRSDQHIOQLSASVGVYIKSTETG 97
|||||
Db 78 QYLAQMTSGLLYSGTSPSECLERLEEN----HYNTYTSKKHAENKWFVGLKKGSC 132
|||||
Qy 98 QYLAQMTDGLLYSGTSPSECLERLEENATPAPHTNTYTSKKHAENKWFVGLKKGSC 157
|||||
Db 133 KRGPRTYQKRAILFLPLPV 152
|||||
Qy 158 KRGPRTYQKRAILFLPLPV 177
|||||
RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF: eye-derived growth factor II; heparin-binding growth
factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
JH0613; S02102; S02661; S22065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE
JH0613
#authors
Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal
Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title
Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts
#cross-references MUID:92245990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE
S02102
#authors
Halley, C.; Courtois, Y.; Laurent, M.
#journal
Nucleic Acids Res. (1988) 16:10913
#title
Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE
S02661
#authors
Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal
FEBS Lett. (1988) 242:41-46
#title
Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE
S22065
#authors
Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
A94290
#authors
Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal
Science (1986) 233:545-548
#title
Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE
A94281
#authors
Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; Disalvo, J.; Thomas, K.
#journal
Science (1985) 230:1385-1388
#title
Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE
S03953
#authors
Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethke,
N.; Sharma, H.S.; Schaper, W.
#journal
Eur. J. Biochem. (1989) 181:67-73
#title
Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE
A91010
#authors
Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal
EMBO J. (1985) 4:1951-1956
#title
Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE
A24477
#authors
Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenhan, W.L.
#journal
Biochemistry (1986) 25:4988-4993
#title
Complete primary structure of prostatin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
REFERENCE
A94127
#authors
Burgess, W.H.; Mehrlan, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal
Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title
Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.:
  Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
#journal
#title Purification of acidic fibroblast growth factor from bovine
#comment heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
##status preliminary
##molecule_type protein
##residues 16-24;121-127;134-143 #label SAS
##experimental_source heart
#comment The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
#comment This protein binds heparin, although less strongly than does bFGF
#comment There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Tyr dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the p
...
Note: remainder of annotations omitted.

Query Match 66.6%; Score 862; DB 1; Length 155;
Best Local Similarity 88.6%; Pred. No. 4.87e-169;
Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1

Db 21 GNYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLSAESVGEVYIKSTETGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 81 AMDTDGLLYSGQTPNEBCLFLERLEEN-----HYNTYISKHAEKHWFGVLKKNGRSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 101 AMDTDGLLYSGQTPNEBCLFLERLEENATPAPHYNTYISKHAEKHWFGVLKKNKSGCRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 136 PRTHFGQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##experimental_source chicken
#comment The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
#comment This protein binds heparin, although less strongly than does bFGF
#comment There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Tyr dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the p
...
Note: remainder of annotations omitted.

Query Match 66.6%; Score 862; DB 1; Length 155;
Best Local Similarity 88.6%; Pred. No. 4.87e-169;
Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1

Db 21 GNYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 41 ANYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLSAESVGEVYIKSTETGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 81 AMDTDGLLYSGQTPNEBCLFLERLEEN-----HYNTYISKHAEKHWFGVLKKNGRSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 101 AMDTDGLLYSGQTPNEBCLFLERLEENATPAPHYNTYISKHAEKHWFGVLKKNKSGCRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 136 PRTHFGQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##experimental_source chicken
#comment The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
#comment This protein binds heparin, although less strongly than does bFGF
#comment There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Tyr dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the p
...
Note: remainder of annotations omitted.

Query Match 66.6%; Score 862; DB 1; Length 155;
Best Local Similarity 88.6%; Pred. No. 4.87e-169;
Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1

Db 21 GNYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 41 ANYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLSAESVGEVYIKSTETGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 81 AMDTDGLLYSGQTPNEBCLFLERLEEN-----HYNTYISKHAEKHWFGVLKKNGRSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 101 AMDTDGLLYSGQTPNEBCLFLERLEENATPAPHYNTYISKHAEKHWFGVLKKNKSGCRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 136 PRTHFGQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##experimental_source chicken
#comment The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
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region flanked by Lys-Tyr dipeptides) and a number of
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...
Note: remainder of annotations omitted.

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Best Local Similarity 88.6%; Pred. No. 4.87e-169;
Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1

Db 21 GNYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 41 ANYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLSAESVGEVYIKSTETGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 81 AMDTDGLLYSGQTPNEBCLFLERLEEN-----HYNTYISKHAEKHWFGVLKKNGRSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 101 AMDTDGLLYSGQTPNEBCLFLERLEENATPAPHYNTYISKHAEKHWFGVLKKNKSGCRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 136 PRTHFGQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##experimental_source chicken
#comment The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
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cells). There are differences in the tissue distribution and
concentration of these two growth factors.
#comment This protein binds heparin, although less strongly than does bFGF
#comment There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Tyr dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the p
...
Note: remainder of annotations omitted.

Query Match 66.6%; Score 862; DB 1; Length 155;
Best Local Similarity 88.6%; Pred. No. 4.87e-169;
Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1

Db 21 GNYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 41 ANYKKPKLLYCSNGGFLRLPLDGTVDGTRDSQHIQLQLSAESVGEVYIKSTETGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 81 AMDTDGLLYSGQTPNEBCLFLERLEEN-----HYNTYISKHAEKHWFGVLKKNGRSKLG 135
|||||:|||||:|||||:|||||:
```

#cross-references	MUID:93246053
#accession	A48834
##status	preliminary
##molecule_type	nucleic acid
##residues	1-189 ##label BOR
##experimental_source	embryo
##note	sequence extracted from NCBI backbone (NCBIN:131000, NCBIP:131001)
REFERENCE	S23636
#authors	Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal	Development (1990) 109:387-393
#title	Fibroblast growth factor during mesoderm induction in the early chick embryo.
#cross-references	MUID:90382254
#accession	S23636
##status	preliminary
##molecule_type	DNA
##residues	95-128 ##label MIT
##cross-references	EMBL:X56804; NID:g62855; PIDN:CAA40139.1; PID:g62856
CLASSIFICATION	superfamily fibroblast growth factor
SUMMARY	#length 189 #molecular-weight 20312 #checksum 8538
Query Match	36.7%; Score 475; DB 2; Length 189;
Best Local Similarity	48.7%; Pred.No. 4.56e-79;
Matches	75; Conservative 29; Mismatches 43; Indels 7; Gaps 2;
Db	43 LPALPDGGGGAFFPGPHKPKRYCKNGGFRLNPGRVDGVREKSDPHIKIQAEE 102
QY	: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: 26 VPSAGARANGTLLDANYKKPILLYCSNGGHFLRPLDPGTVDGTRDSDDHIQLQSAES 85
Db	103 RGVSIVGSANFRFLAMKEDGRLLALKATECECFERLESN-----NYNTYSRKSYSD - 156
QY	::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: 86 VGEVIYKTSTGYLAMDTDGLYGSGTPNEECFLERLEENATPAPHYNTYISKHAEK 145
Db	157 -WTVALKRTQVYPGPPTGPGOKAILFPLMSAKS 189
QY	::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: ::: 146 NWFEVLKGKNSCKRGPRTHYGOKAILFLPVSS 179
RESULT	10
ENTRY	GXBOB #type fragment
TITLE	Basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES	BFGF; kidney-derived growth factor; prostatropin
ORGANISM	[formal_name Bos primigenius taurus #common_name cattle
DATE	13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change 10-Sep-1999
ACCESSIONS	A24663; A32878; A33784; A61550; A61551; A60310; A61094; A01386; A60316; A22054; A24819
REFERENCE	A94290
#authors	Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hierrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal	Science (1986) 233:545-548
#title	Nucleotide sequence of a bovine clone encoding the angiotensin protein, basic fibroblast growth factor.
#cross-references	MUID:86261806
#accession	A24663
##molecule_type	mRNA
##residues	3-157 ##label ABR
##cross-references	GB:M13440; NID:gl63049; PIDN:AAA30518.1; PID:gl63050
##experimental_source	pituitary gland
REFERENCE	A90924
#authors	Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes, J.C. Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668 Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells.
#cross-references	MUID:87217066
#accession	A32878
##molecule_type	mRNA
##residues	3-157 ##label AB2
REFERENCE	A33784
#authors	Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel, Nel., Deuel, T.F.

cr
tac

```

ORGANISM      #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS    S00185
REFERENCE      Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
#authors      E.C.; Rubira, M.R.; Burgess, A.W.
#journal      FERS Lett. (1987) 224:128-132
#title        Primary structure of ovine pituitary basic fibroblast growth
factor.
#cross-references MUID:88055577
#accession    S00185
#molecule_type protein
#residues     1-146 ##label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS      growth factor; heparin binding; mitogen
FEATURE
18-22         #region heparin binding #status predicted
107-110       #region heparin binding #status predicted
SUMMARY       #length 146 #molecular-weight 16434 #checksum 3560

Query Match      35.7%; Score 462; DB 1; Length 146;
Best Local Similarity 49.0%; Pred. No. 4.00e-76;
Matches          75; Conservative 29; Mismatches 42; Indels 7; Gaps 2;

Db 1 PALPEDGSSAFPPGHPKPKRYCKNGFFLRHPDGRVDGVRKSDPHIKLQAEER 60
   1 : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 27 PSPAGARANGTLLDANKPKPKLYCSNGHFLRLPDGTVDGTRDSQHQIQLSAESV 86
   1 : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 61 GVYSIKGCANRYLAKMEDGRLASKCVTDECFEERLESN----NNTYRSRKYS--S 113
   1 : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 87 GEVTKSTGTGYLAMDTDGLLYGSGTPNEECLEERLEENATPAPHNTIYISKHAEN 146
   1 : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 114 WYVALKRTGYKLGKTPGQKAILFLPMSAKS 146
   1 : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 147 WFVGLKNGSKGRPRHYGKAILFLPLPVS 179
   1 : : : : : : : : : : : : : : : : : : : : : : : : : : : :

RESULT 12
ENTRY    A32398 #type complete
TITLE    basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
               prostatin
CONTAINS  basic fibroblast growth factor, 18K form
ORGANISM  formal_name Homo sapiens #common_name man
DATE      31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
SESSIONS  A32398; A61537; A26642; B32878; S00297; A54316; B54316;
          A33624; A25824; B24243; B24301; S42242; B55784; I52267;
          S46253
REFERENCE A32398
#authors  Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
          J.M.; Liauau, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
          Smith, J.A.; Caput, D.
#journal  Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title    High molecular mass forms of basic fibroblast growth factor
          are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues  1-210 ##label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE A61537
#authors  Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal  Growth Factors (1991) 4:277-287
#title    Functional characterization of the human basic fibroblast
          growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues  1-114 ##label SHI
#note     authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE A26642
#authors  Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal  FERS Lett. (1987) 213:189-194
#title    Cloning and expression of cDNA encoding human basic
          fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues  56-210 ##label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE A30924
#authors  Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
          J.C.
#journal  Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title    Human basic fibroblast growth factor: nucleotide sequence,
          genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues  56-210 ##label ABR
#note     the authors translated the codon GAA for residue 108 as
          Gly
REFERENCE S00297
#authors  Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
          J.; Gospodarowicz, D.; Fiddes, J.C.
#journal  EMBO J. (1986) 5:2523-2528
#title    Human basic fibroblast growth factor: nucleotide sequence and
          genomic organization.
#cross-references MUID:87053817
#accession S00297
#status    not compared with conceptual translation
#molecule_type DNA
#residues  1-155 ##label AB2
#note     the authors translated the codon GAA for residue 108 as
          Gly
REFERENCE A54316
#authors  Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
          Hirohashi, S.
#journal  Jpn. J. Cancer Res. (1991) 82:1263-1270
#title    Characterization of high-molecular-mass forms of basic
          fibroblast growth factor produced by hepatocellular
          carcinoma cells: possible involvement of basic fibroblast
          growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues  'XX',86-88,'X',90-91,'X',93-95 ##label SH3
#note     experimental source C-Li21 hepatocellular carcinoma cell line
          sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues  'XX',19,'X',21-29 ##label SH2
#note     sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors  Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
          L.C.; Barr, P.J.; Baird, A.
#journal  J. Cell Biol. (1989) 109:3105-3114
#title    Differential effects of heparin, fibronectin, and laminin on
          the phosphorylation of basic fibroblast growth factor by
          protein kinase C and the catalytic subunit of protein
          kinase A.
#cross-references MUID:90078343
#accession A33624
#status    preliminary
#molecule_type protein
#residues  57-210 ##label FEI
REFERENCE A25824
#authors  Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
          S.C.; Lawson, R.K.
#journal  Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title    Amino-terminal sequence of a large form of basic fibroblast
          growth factor isolated from human benign prostatic
          hyperplastic tissue.

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#cross-references MUID:87156686
#accession
#molecule_type protein
#residues 57-77 ##label STO
#experimental_source prostate
REFERENCE
A90122
Gineez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession
#molecule_type protein
#residues 65-102, 'X', 104-105 ##label GIM
#experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession
#molecule_type protein
#residues 85-88, 'X', 90-98, 'X', 100 ##label GAU
#authors
Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
Biochem. Biophys. Res. Commun. (1987) 144:543-550
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession
#status preliminary
#molecule_type mRNA
#residues 54-210 ##label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087
REFERENCE
A55784
Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession
#molecule_type protein
#residues 54-71 ##label PAN
#authors
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
Reverse transcription with nested polymerase chain reaction
shows transposon of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession
#status preliminary; translated from GB/EMBL/DDBJ
#molecule_type mRNA
#residues 95-182 ##label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells
REFERENCE
S46253
Patri, V.; Bugler, B.; Amalric, F.; Promé, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (bFGF-2).
#cross-references MUID:94320639
#accession
#molecule_type protein
#residues 57-77 ##label STO
#experimental_source prostate
REFERENCE
A90122
Gineez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession
#molecule_type protein
#residues 65-102, 'X', 104-105 ##label GIM
#experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession
#molecule_type protein
#residues 85-88, 'X', 90-98, 'X', 100 ##label GAU
#authors
Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
Biochem. Biophys. Res. Commun. (1987) 144:543-550
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession
#status preliminary
#molecule_type mRNA
#residues 54-210 ##label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087
REFERENCE
A55784
Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession
#molecule_type protein
#residues 54-71 ##label PAN
#authors
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
Reverse transcription with nested polymerase chain reaction
shows transposon of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
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S46253
Patri, V.; Bugler, B.; Amalric, F.; Promé, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (bFGF-2).
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#residues 57-77 ##label STO
#experimental_source prostate
REFERENCE
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Gineez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
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#experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
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#accession
#molecule_type protein
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Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
Biochem. Biophys. Res. Commun. (1987) 144:543-550
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
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Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
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Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
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S46253
Patri, V.; Bugler, B.; Amalric, F.; Promé, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
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recombinant basic fibroblast growth factor form (bFGF-2).
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#residues 57-77 ##label STO
#experimental_source prostate
REFERENCE
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Gineez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
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factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession
#molecule_type protein
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A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett.
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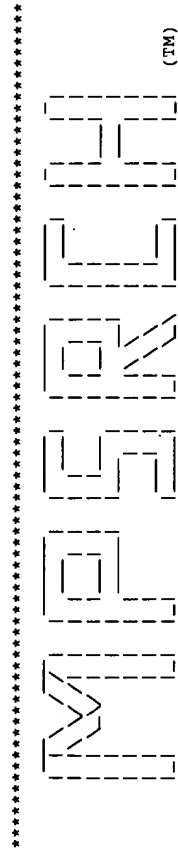
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            12-Apr-1995
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            #submission   submitted to the EMBL Data Library, September 1992
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Search completed: Tue Aug 29 16:17:30 2000
Job time : 19 secs.

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm

On: Tue Aug 29 16:14:14 2000; Maspar time 7.30 Seconds
764.304 Million cell updates/sec

Title: >US-09-121-017B-29
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Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: swiss-prot38
1:swissprot

Statistics: Mean 44.269; Variance 68.487; scale 0.646

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

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2	914	70.6	HEPARIN-BINDING GROWTH	9.62e-205
3	911	70.4	HEPARIN-BINDING GROWTH	6.11e-204
4	900	69.6	HEPARIN-BINDING GROWTH	5.35e-201
5	862	66.6	HEPARIN-BINDING GROWTH	7.59e-191
6	861	66.5	HEPARIN-BINDING GROWTH	1.40e-190
7	475	36.7	HEPARIN-BINDING GROWTH	2.45e-89
8	469	36.2	HEPARIN-BINDING GROWTH	8.36e-88
9	463	35.8	HEPARIN-BINDING GROWTH	2.83e-86
10	462	35.7	HEPARIN-BINDING GROWTH	5.10e-86
11	458	35.4	HEPARIN-BINDING GROWTH	5.33e-85
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13	450	34.8	HEPARIN-BINDING GROWTH	5.78e-83
14	438	33.8	HEPARIN-BINDING GROWTH	6.42e-80
15	418	32.3	HEPARIN-BINDING GROWTH	7.30e-75
16	327	25.3	GLIA-ACTIVATING FACTOR	3.01e-52
17	316	24.4	GLIA-ACTIVATING FACTOR	1.44e-49
18	316	24.4	GLIA-ACTIVATING FACTOR	1.44e-49
19	316	24.4	GLIA-ACTIVATING FACTOR	1.44e-49
20	298	23.0	FIBROBLAST GROWTH FACT	3.25e-45
21	293	22.6	FIBROBLAST GROWTH FACT	5.17e-44
22	280	21.6	FIBROBLAST GROWTH FACT	6.64e-41
23	260	20.1	FIBROBLAST GROWTH FACT	3.58e-36

RX MEDLINE; 92019819.
 RA Wang W.P., Quick D., Balcerzak S.P., Needelman S.W., Chiu I.M.;
 RT "Cloning and sequence analysis of the human acidic fibroblast growth
 RT factor gene and its preservation in leukemia patients.";
 RN Oncogene 6:1521-1529(1991).
 RN [16]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 92202857.
 RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,
 RA Turk E.J.;
 RA "An acidic fibroblast growth factor protein generated by alternate
 RT splicing acts like an antagonist.";
 RT J. Exp. Med. 175:1073-1080(1992).
 RN [17]
 RP SEQUENCE OF 1-154 FROM N.A.
 RX MEDLINE; 94069734.
 RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;
 RA "The expression of acidic fibroblast growth factor (heparin-binding
 RT growth factor-1) and cytokine genes in human cardiac allografts and T
 RT cells.";
 RN Transplantation 56:1177-1182(1993).
 RN [18]
 RP SEQUENCE OF 1-40 FROM N.A.
 RX MEDLINE; 90365758.
 RA Crumley G., Dionne C.A., Jaye M.;
 RA "The gene for human acidic fibroblast growth factor encodes two
 RT upstream exons alternatively spliced to the first coding exon.";
 RT Biochem. Biophys. Res. Commun. 171:7-13(1990).
 RN [19]
 RP SEQUENCE OF 16-155.
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 RA Harper J.W., Strydom D.J., Lobb R.R.;
 RA "Human class I heparin-binding growth factor: structure and homology
 RT to bovine acidic brain fibroblast growth factor.";
 RT Biochemistry 25:4097-4103(1986).
 RN [10]
 RP SEQUENCE OF 16-155.
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 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
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 RA Gautschi-Sova P., Mueller T., Boehlen P.;
 RA "Amino acid sequence of human acidic fibroblast growth factor.";
 RT Biochem. Biophys. Res. Commun. 140:874-880(1986).
 RN [12]
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 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
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 RT amino terminal sequences and specific mitogenic activities.";
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 RA Gautschi P., Frater-Schroeder M., Boehlen P.;
 RA "Partial molecular characterization of endothelial cell mitogens from
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 RT FEBS Lett. 204:203-207(1986).
 RN [14]
 RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
 RX MEDLINE; 96194129.
 RA Blaber M., Disalvo J., Thomas K.A.;
 RA "X-ray crystal structure of human acidic fibroblast growth factor.";
 RT Biochemistry 35:2086-2094(1996).
 RN [15]
 RP STRUCTURE BY NMR OF 24-155.
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 RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,
 RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast
 RT growth factor activated by inositol hexasulfate.";
 RN J. Mol. Biol. 242:81-98(1994).
 RN [16]
 RP STRUCTURE BY NMR OF 24-155.
 RX MEDLINE; 97107535.
 RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
 RA Rico M., Gimenez-Gallego G.;
 RA "Three-dimensional structure of acidic fibroblast growth factor in
 RT solution: effects of binding to a heparin functional analog.";
 RN J. Mol. Biol. 264:162-178(1996).
 RN [17]
 RP STRUCTURE BY NMR OF 25-155.
 RX MEDLINE; 98387896.
 RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
 RA "Solution structure of acidic fibroblast growth factor bound to 1,3,
 RT 6-naphthalenetrisulfonate: a minimal model for the anti-tumoral
 RT action of suramin and suradistas.";
 RN J. Mol. Biol. 281:899-915(1998).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC -----
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 CC between the Swiss Institute of Bioinformatics and the EMBL outstation -
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 DR PIR; A24820; A24820.
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 DR PIR; A33665; A33665.
 DR PIR; S18217; S18217.
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 DR PROSITE; PS00247; HBGFFGF; 1.
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 KW 3D-structure.
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 FT BINDING 113 116 HEPARIN (POTENTIAL).
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DT 15-JUL-1999 (Rel. 38, Last annotation update)
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OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
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RC MEDLINE; 89240051.
RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
RT "The nucleotide sequence of rat heparin binding growth factor 1
RT (HBGF-1).";
RL Nucleic Acids Res. 17:2867-2867(1989).
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RP SEQUENCE FROM N.A.
RC SPECIES=MOUSE;
RC MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
RN [3]
RP SEQUENCE FROM N.A.
RC SPECIES=MOUSE;
RC MEDLINE; 97128312.
RA Madiai F., Hackshaw K.V., Chiu I.M.;
RT "Cloning and characterization of the mouse Fgf-1 gene.";
RL Gene 179:231-236(1996).
RN [4]
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RC MEDLINE; 97094746.
RA Alam K.Y., Frostholt A., Hackshaw K.V., Evans J.E., Rotter A.,
RA Chiu I.M.;
RT "Characterization of the 1b promoter of fibroblast growth factor 1
RT and its expression in the adult and developing mouse brain.";
RL J. Biol. Chem. 271:30263-30271(1996).
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CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
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CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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DR HSSP; P05230; ZAXM.
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DR PRINTS; PR00262; ILIHGF.

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DT	01-MAR-1989 (Rel. 10, Last sequence update)	
DT	15-JUL-1999 (Rel. 38, Last annotation update)	
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DE	BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF	
DE	II).	
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RA	Halley C., Courtois Y., Laurent M.;	
RL	"Nucleotide sequence of bovine acidic fibroblast growth factor cDNA." Nucleic Acids Res. 16:10913-10913(1988).	
[2]		
RN	SEQUENCE FROM N.A.	
RP	TISSUE=RETINA;	
RC	MEDLINE; 89078619.	
RA	Aterio J., Halley C., Brou C., Soussi T., Courtols Y., Laurent M.;	
RL	"Characterization of a bovine acidic GF cDNA clone and its expression in brain and retina."; FEBS Lett. 242:41-46(1988).	
[3]		
RN	SEQUENCE OF 2-155.	
RP	MEDLINE; 87016918.	
RA	Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;	
RL	"Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor."; Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).	
[4]		
RN	SEQUENCE OF 2-155.	
RP	MEDLINE; 87026586.	

RA Crabb J.W., Ames L.G., Carr S.A., Johnson C.M., Roberts G.D.,
 RA Bordoli R.S., McKeenhan W.L.;
 RT "Complete primary structure of prostatin, a prostate epithelial
 RT cell growth factor.";
 RL Biochemistry 25:4988-4993(1986).
 RN [5]
 RP SEQUENCE OF 16-155.
 RX MEDLINE; 86070224.
 RA Gimenez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,
 RA Disalvo J., Thomas K.;
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid
 RT sequence and homologies.";
 RL Science 230:1385-1388(1985).
 RN [6]
 RP SEQUENCE OF 16-44, AND COMPOSITION.
 RX MEDLINE; 86055750.
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:
 RT amino-terminal sequence and comparison with basic FGF.";
 RL EMBO J. 4:1951-1956(1985).
 RN [7]
 RP SEQUENCE OF 16-56 FROM N.A.
 RX MEDLINE; 86261806.
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,
 RA Hjerrild K.A., Gospodarowicz D., Fiddes J.C.;
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic
 RT protein, basic fibroblast growth factor.";
 RL Science 233:545-548(1986).
 RN [8]
 RP SEQUENCE OF 16-45.
 RX MEDLINE; 89231704.
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,
 RA Sharma H.S., Schaper W.;
 RT "Isolation of heparin-binding growth factors from bovine, porcine and
 RT canine hearts.";
 RL Eur. J. Biochem. 181:67-73(1989).
 RN [9]
 RP SEQUENCE OF 1-18 FROM N.A.
 RX MEDLINE; 91095983.
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RA Hsu B.T., Rees D.C.;
 RT "Three-dimensional structures of acidic and basic fibroblast growth
 RT factors.";
 RL Science 251:90-93(1991).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC or send an email to license@isb-sib.ch).
 CC
 CC EMBL; M13439; AAA30516.1;
 CC EMBL; X13221; CAA31610.1;
 CC EMBL; X14032; CAA32192.1;
 CC EMBL; M35608; AAA30517.1;
 CC EMBL; X66446; CAA47063.1;
 CC EMBL; M97660; AAA30563.1;
 CC EMBL; M97661; AAA30564.1;
 CC PIR; A01385; GRBOA.

DR PIR; A25043; A25043.
 DR PIR; B25043; B25043.
 DR PIR; C25043; C25043.
 DR PIR; A24477; A24477.
 DR PIR; B24663; B24663.
 DR PIR; S02102; S02102.
 DR PDB; 1BAR; 31-OCT-93.
 DR PDB; 1AFC; 31-OCT-93.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILJHGF.
 DR PRINTS; PR00263; HBGF-FGF.
 DR PROSITE; PS00247; HBGF-FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 KW 3D-structure.
 FT PROPEP 1 15
 FT CHAIN 2 155
 FT CHAIN 16 155
 FT CHAIN 22 155
 FT MOD_RES 2 2
 FT BINDING 24 28
 FT BINDING 113 116
 FT STRAND 27 31
 FT TURN 32 34
 FT STRAND 37 40
 FT TURN 42 43
 FT STRAND 46 49
 FT HELIX 55 57
 FT STRAND 59 61
 FT STRAND 69 69
 FT STRAND 71 73
 FT TURN 84 85
 FT STRAND 87 91
 FT HELIX 96 98
 FT STRAND 100 100
 FT STRAND 103 104
 FT TURN 106 107
 FT STRAND 110 111
 FT STRAND 113 114
 FT TURN 116 121
 FT STRAND 123 123
 FT STRAND 126 126
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 FT STRAND 132 132
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 FT HELIX 135 137
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 FT TURN 144 145
 FT STRAND 147 150
 SQ SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;
 Query Match 66.6%; Score 862; DB 1; Length 155;
 Best Local Similarity 88.6%; Pred. No. 7.58e-191;
 Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1;
 Db 21 GNKKPKLYCNGGVFLRILPDGVTGDKRSDQHIQQLCAESIGEVYIKSTE*GQFL 80
 QY 41 ANKKPKLYCNGGVFLRILPDGVTGDKRSDQHIQQLCAESIGEVYIKSTE*GQYL 100
 Db 81 AMDTDGLLYGSGTTPNEECFLERLEEN-----HYNTYISKKAHKKHWFVGLKKN*RSKLG 135
 QY 101 AMDTDGLLYGSGTTPNEECFLERLEENATPAPHYNTYISKKAHKKHWFVGLKKN*SCRKG 160
 Db 136 PRTHFGQKAILFLPLPVSSD 155
 QY 161 PRTHFGQKAILFLPLPVSSD 180
 RESULT 6
 ID FGF1_CHICK STANDARD; PRT; 155 AA.
 AC P19596;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)


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QY      :|:|:|:| | ||:| |||| |::| |
146 NWFVGLKKNCSCKRGPRTHYGQKAILFLPLPVSS 179
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RESULT	9	STANDARD;	PRT;	155 AA.
ID	FGF2_SHEEP			
AC	P20003;			
DT	01-FEB-1991 (Rel. 17, Created)			
DT	01-FEB-1996 (Rel. 33, Last sequence update)			
DT	01-FEB-1996 (Rel. 33, Last annotation update)			
DE	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).			
DE	FGF2 OR FGF-2.			
OS	Ovis aries (Sheep).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;			
OC	Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidea;			
OC	Bovidae; Caprinae; Ovis.			
RN	[1]			
	SEQUENCE FROM N.A.			
	Sutton R., Ward W.G., Raphael K.A., Cam G.R.;			
	Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.			

Dd 122 SNYVALKRTGYKLGPQCKQAILELPLPSAKS 155
 :!::!!!: ! ::!!: !!!!!!!!!: !
Qy 146 NNFVGLKKNGSKGRPRTHYGOKAILELPVPSS 179

RESULT 10

ID	FGF2_HUMAN	STANDARD;	PRT; 155 AA.
AC	P09038;		
DT	01-NOV-1988 (Rel. 09, Created)		
DD	01-NOV-1988 (Rel. 09, Last sequence update)		
DE	01-NOV-1997 (Rel. 35, Last annotation update)		
DE	Heparin-binding growth factor 2 precursor (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).		
DE	FGF2 OR FGFB.		
OS	Homo sapiens (Human).		
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;		
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.		
RN	[1]		
RX	SEQUENCE FROM N.A.		
RX	MEDLINE; 87053817.		
RA	Abrahim J.A., Whang J.L., Tumolo A., Mergia A., Friedman J., Gospodarowicz D., Fiddes J.C.;		
RA	"Human basic fibroblast growth factor: nucleotide sequence and genomic organization."		
RT	Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).		
RL	[3]		
RN	SEQUENCE FROM N.A.		
RN	[2]		
RX	SEQUENCE FROM N.A.		
RX	MEDLINE; 87213238.		
RA	Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;		
RA	"Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells.";		
RT	Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).		
RN	[3]		
RN	SEQUENCE FROM N.A.		
RN	[4]		
RX	Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M., Rifkin D.B.;		
RA	"A form of human basic fibroblast growth factor with an extended amino terminus.";		
RT	Biochem. Biophys. Res. Commun. 144:543-550(1987).		
RN	[4]		
RN	SEQUENCE FROM N.A.		
RX	MEDLINE; 87162468.		
RA	Kurokawa T., Saseada R., Iwane M., Igarashi K.;		
RA	"Cloning and expression of cDNA encoding human basic fibroblast growth factor.";		
RT	FEBS Lett. 213:189-194(1987).		
RN	[5]		
RN	SEQUENCE FROM N.A.		
RX	MEDLINE; 89184522.		
RA	Prats H., Kaghad M., Prats A.C., Kiagabrun M., Lelias J.M., Liauzon P., Chalton P., Tauber J.P., Amalric F., Smith J.A., Caput D.;		
RA	"High molecular mass forms of basic fibroblast growth factor are initiated by alternative CUG codons.";		
RT	Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).		
RN	[6]		
RN	SEQUENCE OF 10-35.		
RX	MEDLINE; 86275260.		
RA	Gautschi P., Frater-Schroeder M., Boehlen P.;		
RA	"Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors.";		
RT	FEBS Lett. 204:203-207(1986).		
RN	[7]		
RN	SEQUENCE OF 10-39.		
RX	MEDLINE; 86186784.		
RA	Gimenez-Gallogo G., Conn G., Hatcher V.B., Thomas K.A.;		
RA	"human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities.";		
RT	Biochem. Biophys. Res. Commun. 135:541-548(1986).		
RN	[8]		
RN	SEQUENCE OF 2-22.		
RN			

RX MEDLINE; 87156686.
RA Story M.T., Esch F., Shimazaki S., Sasse J., Jacobs S.C., Lawson R.K.;
RT "Amino-terminal sequence of a large form of basic fibroblast growth
factor isolated from human benign prostatic hyperplastic tissue.";
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).
RN [9]
RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
RX MEDLINE; 91195367.
RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;
RT "Three-dimensional structure of human basic fibroblast growth
factor.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).
RN [10]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 94004464.
RA Eriksson A.E., Cousens L.S., Matthews B.W.;
RT "Refinement of the structure of human basic fibroblast growth factor
at 1.6-A resolution and analysis of presumed heparin binding sites by
selenate substitution.";
RL Protein Sci. 2:1274-1284(1993).
RN [11]
RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).
RX MEDLINE; 91195368.
RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;
RT "Three-dimensional structure of human basic fibroblast growth factor,
a structural homolog of interleukin 1 beta.";
RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).
RN [12]
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
RX MEDLINE; 92121151.
RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;
RT "Crystal structure of basic fibroblast growth factor at 1.6-A
resolution.";
RL J. Biochem. 110:360-363(1991).
RN [13]
RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).
RX MEDLINE; 91095983.
RA Zhu B.T., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,
RT "Three-dimensional structures of acidic and basic fibroblast growth
factors.";
RL Science 251:90-93(1991).
RN [14]
RP STRUCTURE BY NMR.
RX MEDLINE; 97040521.
RA Moy F.J., Seadon A.P., Boehlen P., Powers R.;
RT "High-resolution solution structure of basic fibroblast growth factor
determined by multidimensional heteronuclear magnetic resonance
spectroscopy.";
RL Biochemistry 35:13552-13561(1996).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC
CC EMBL; M17599; AAA52534.1; ALT_INIT.
DR EMBL; X04431; CA28027.1; -
DR EMBL; X04432; CA28028.1; -
DR EMBL; X04433; CA28029.1; -
DR EMBL; M27968; AAA52448.1; -
DR EMBL; J04513; AAA52533.1; ALT_INIT.

DR PIR; A25824; A25824.
DR PIR; A26642; A26642.
DR PIR; B24243; B24243.
DR PIR; B24301; B24301.
DR PIR; B32878; B32878.
DR PIR; S00297; S00297.
DR PDB; 2FGF; 15-APR-92.
DR PDB; 4FGF; 15-JUL-93.
DR PDB; 1FGA; 15-JUL-93.
DR PDB; 1BFB; 03-APR-96.
DR PDB; 1BFC; 03-APR-96.
DR PDB; 1BFF; 16-JUN-97.
DR PDB; 1BFG; 31-JAN-94.
DR PDB; 2BFH; 30-APR-94.
DR PDB; 1BLA; 08-NOV-96.
DR PDB; 1BLD; 08-NOV-96.
DR MIM; 134920; -
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PRO0262; ILIHGFG.
DR PRINTS; PRO0263; HBGFGFG.
DR PROSITE; PS00247; HBGFGFG; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding;
KW 3D-structure.
FT PROPEP 1 9
FT CHAIN 10 155
FT SITE 46 48
FT SITE 88 90
FT BINDING 27 31
FT BINDING 116 119
FT STRAND 30 34
FT TURN 35 38
FT STRAND 39 43
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FT STRAND 49 52
FT TURN 55 56
FT HELIX 58 60
FT TURN 62 66
FT TURN 69 70
FT STRAND 71 76
FT TURN 77 80
FT STRAND 81 85
FT TURN 87 88
FT STRAND 91 94
FT HELIX 99 101
FT STRAND 103 107
FT TURN 109 110
FT STRAND 113 117
FT TURN 121 122
FT STRAND 124 124
FT STRAND 127 127
FT TURN 129 130
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FT HELIX 136 138
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FT HELIX 144 146
FT STRAND 148 152
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Best Local Similarity 48.7%; Pred. No. 5.10e-86;
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Db 9 LPALPEDGCGSAFPGPHKDKPKRYCKNGGFFLRHDPGRVDGVREKSDPHIKLOLQAE 68
Qy 26 YPSAPAGARANGTLLDANYKKPKLLYCSNGHFLRILPDGTYDGTDRSDQHIQLSAES 85
Db 69 RGVYSIKGVANRYLANKEDGRLLASKCVTDCEFFERLESN----NYNTYRSKYT-- 121
Qy 86 VGEVIKSTETGQYLAAMDTDGLLYGSQTPNEECFLFLEENATPAPHINTYISKHAEK 145
Db 122 SWYVALKRTGYKLGSKTGPQKAILFLPMSAKS 155
Qy 146 NWFVGLKKGSKRGPRTHYGYKAILFLPLPVSS 179

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DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP      9
FT CHAIN       10 154    HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING     26 30     HEPARIN (POTENTIAL).
FT BINDING     115 118   HEPARIN (POTENTIAL)..
SQ SEQUENCE    154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match          35.4%; Score 458; DB 1; Length 154;
Best Local Similarity 50.7%; Pred. No. 5.33e-85;
Matches 74; Conservative 26; Mismatches 39; Indels 7; Gaps 2;

Db 16 GGGAPPCHGFKPKRLXCKNGGFFLRHPDGVRDVGVREKSDPHVKLQLQAEERGVWSIK 75
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Qy 34 ANGLLDANYKKPKLLYCSNGHGFLRILPDGTVDGTRDSOHOHLQLQSASVEVVIKS 93

Db 76 VCARYLAMKEJDKLLASKVCVTESCFPERLESN-----NYNTVRSKYIS--SWYVALKR 128
   : ||||| | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy 94 TETQGYLAMTDGILLYGSQTPNECLFLERENATPAPHYNTYISKHAEKKNFWGLKK 153

Db 129 TGQVYLKSKTGPQOKAILFLPMSAKS 154
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Qy 154 NGSCRGRPTHYGOKAILFLPLPVSS 179

RESULT 12
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC PI5655;
DT 01-APR-1990 (Rel. 14, Created)
DI 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGE) (PROSTATOPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basillio C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC ARGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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EMBL; M30644; AAA37621.1; -.
DR PIR; C37360; C37360.
DR HSPG; P09038; IBFF.
DR MGD; MG1:95516; FGF2.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHGFG.
DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP      1
FT CHAIN       10 154    HEPARIN-BINDING GROWTH FACTOR 2.
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DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP      9
FT CHAIN       10 154    HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING     26 30     HEPARIN (POTENTIAL).
FT BINDING     115 118   HEPARIN (POTENTIAL)..
SQ SEQUENCE    154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match          35.4%; Score 458; DB 1; Length 154;
Best Local Similarity 50.7%; Pred. No. 5.33e-85;
Matches 74; Conservative 26; Mismatches 39; Indels 7; Gaps 2;

Db 16 GGGAPPCHGFKPKRLXCKNGGFFLRHPDGVRDVGVREKSDPHVKLQLQAEERGVWSIK 75
   : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy 34 ANGTLLDANYKKPKLLYCSNGHGFLRILPDGTVDGTRDSOHOHLQLQSASVEVGIKS 93

Db 76 VCARYLAMKEJDKLLASKVCVTESCFFPERLESN-----NYNTVRSKYIS--SWYVALKR 128
   : |||| | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy 94 TETQGYLAMTDGGLLYGSQTPNECLFLERENATPAPHYNTYISKHAEKNFVGLIK 153

Db 129 TGQVYLKSKTGPQGAKAILFLPMSAKS 154
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Qy 154 NGSCRGRPTHYGOKAILFLPLPVSS 179

RESULT 12
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC C15655;
DT 01-APR-1990 (Rel. 14, Created)
DI 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGE) (PROSTATOPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basillio C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
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CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC ARGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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EMBL; M30644; AAA37621.1; -.
DR PIR; C37360; C37360.
DR HSPG; P09038; IBFF.
DR MGD; MG1:95516; FGF2.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHGFG.
DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP      1
FT CHAIN       10 154    HEPARIN-BINDING GROWTH FACTOR 2.
```

FT BINDING 26 30 HEPARIN (POTENTIAL).
 SQ BINDING 115 HEPARIN (POTENTIAL).
 Query Match 35.08; Score 453; DB 1; Length 154;
 Best Local Similarity 52.58; Pred. No. 9.97e-84;
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 2;

Db 23 GHFKPRKRYCKNGGFFLRHPDGRVREKSDPHVKLQLOAERGWSIKGVCANRYL 82
 QY 41 ANYKKPKLLYCSNGHFLRLPDGTGDRSDOHIQLOLSAESVGEYIKSTETGQYL 100
 Db 83 AMKEDGRLLASKVTECEFFERLESN-----NYNYSRKYSS--SWYVALKRTGYKLG 135
 QY 101 AMDTGGLLYGSQTPNEBCLFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSKRG 160
 Db 136 SKTGPCKAILFLPMSAKS 154
 QY 161 PRTHYGOKAILFLPLPVSS 179

RESULT 13
 ID FGF2_MONDO STANDARD; PRT; 156 AA.
 AC F48798;
 DT 01-FEB-1996 (Rel. 33, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN Monodelphis domestica (Short-tailed grey opossum).
 OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE=EYE;
 RX MEDLINE; 94296558.
 RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;
 RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica";
 RL DNA Cell Biol. 13:549-554(1994).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGE.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 DR EMBL; Z15154; CAA79854.1; ALT_INIT.
 DR HSP; P09038; 1BFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGFEGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9 BY SIMILARITY.
 FT CHAIN 10 156 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 28 32 HEPARIN (POTENTIAL).
 FT BINDING 117 120 HEPARIN (POTENTIAL).
 SQ SEQUENCE 156 AA; 17303 MW; 7E555FCC49BF1209 CRC64;

Query Match 34.88; Score 450; DB 1; Length 156;
 Best Local Similarity 47.88; Pred. No. 5.78e-83;

Matches 77; Conservative 28; Mismatches 48; Indels 8; Gaps 3;

Db 4 GSITLPAISDGG--GGGAPPGEKPKRKYCKNGGFFLRHPDGRVDRGIREKSDPNIK 62
 QY 19 GVLVGMVPSAGARANGTLLDANYKKPKLLYCSNGGFLRLPDGTGDRSDOHIQ 78
 Db 63 LQLOAERGWSIKGVCANRYLAMKEDGRLLALKYVTECEFFERLESN-----NYNYSR 117
 QY 79 LQLSAESVGEYIKSTETGQYLAMDTGGLLYGSQTPNEBCLFLERLEENATPAPHYNTYI 138
 Db 118 SKYS--SWYVALKRTGYKLGSKTGPCKAILFLPMSAKS 156
 QY 139 SKHAEKNWFVGLKNGSKRGPRTHYGOKAILFLPLPVSS 179

RESULT 14
 ID FGF2_XENLA STANDARD; PRT; 155 AA.
 AC P12226;
 DT 01-OCT-1989 (Rel. 12, Created)
 DT 01-JAN-1990 (Rel. 13, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).
 GN Xenopus laevis (African clawed frog).
 OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae;
 OC Xenopodinae; Xenopus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 89058621.
 RA Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;
 RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer";
 RL Science 242:1053-1056(1988).
 RN [2]
 RP SEQUENCE OF 95-155 FROM N.A.
 RX MEDLINE; 88052890.
 RA Kimelman D., Kirschner M.;
 RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early xenopus embryo";
 RL Cell 51:869-877(1987).
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 DR EMBL; M18067; AAA49726.1; -.
 DR PIR; A29618; A29618.
 DR PIR; A40117; A40117.
 DR HSP; P09038; 1BFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 DR PRINTS; PR00263; HBGFEGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 27 31 HEPARIN (POTENTIAL).
 FT BINDING 116 119 HEPARIN (POTENTIAL).
 FT CONFLICT 111 111 MISSING (IN REF.?).
 SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 33.88; Score 438; DB 1; Length 155;
 Best Local Similarity 47.48; Pred. No. 6.42e-80;
 Matches 73; Conservative 29; Mismatches 45; Indels 7; Gaps 2;

MAJOR (TM)

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MPearch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 16:14:58 2000; MasPar time 16.85 Seconds
740.486 Million cell updates/sec
Regular output not generated.

Title: >US-09-121-017B-29
Description: (1-180) from US09121017B.pep
Perfect Score: 1294
Sequence: 1 MSRCGRVQGTQLQALVGV.....PRTHYGOKAILFLPLPVSSD 180

Scoring table: PAM 150
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: sptrembl12

1:sp_archaea 2:sp_bacteria 3:sp_fungi 4:sp_human
5:sp_invertebrate 6:sp_mammal 7:sp_mhc 8:sp_organelle
9:sp_phase 10:sp_plant 11:sp_rodent 12:sp_unclassified
13:sp_vertebrate 14:sp_virus

Statistics: Mean 42.961; Variance 69.627; scale 0.617

Pred. No. is the number of results predicted by chance to have a
score greater than or equal to the score of the result being printed,
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	462	35.7	196	4	21 KD BASIC FIBROBLAST	2.02e-82
2	456	35.2	130	6	BASIC FIBROBLAST GROWTH	5.88e-81
3	327	25.3	101	13	BASIC-EGF (FRAGMENT)	4.69e-50
4	291	22.5	146	13	FIBROBLAST GROWTH FACT	1.08e-41
5	270	20.9	212	13	FIBROBLAST GROWTH FACT	6.87e-37
6	266	20.6	59	4	ACIDIC FIBROBLAST GROW	5.55e-36
7	267	20.6	60	4	ACIDIC FIBROBLAST GROW	3.29e-36
8	264	20.4	70	11	ACIDIC FIBROBLAST GROW	1.58e-35
9	258	19.9	115	11	BASIC FIBROBLAST GROW	3.57e-34
10	253	19.6	252	11	FHF-4B	4.75e-33
11	247	19.1	194	6	KERATINOCYTE GROWTH FA	1.05e-31
12	238	18.4	243	13	FIBROBLAST GROWTH FACT	1.06e-29
13	234	18.1	192	4	FIBROBLAST GROWTH FACT	8.13e-29
14	234	18.1	245	13	FIBROBLAST GROWTH FACT	8.13e-29
15	233	18.0	127	4	FIBROBLAST GROWTH FACT	1.35e-28
16	212	16.4	186	13	PUTATIVE FIBROBLAST GR	5.27e-24
17	212	16.4	206	13	FIBROBLAST GROWTH FACT	5.27e-24
18	190	14.7	129	4	R33683_2	2.60e-19
19	189	14.6	114	4	BASIC FIBROBLAST GROW	4.22e-19
20	189	14.6	114	4	BASIC FIBROBLAST GROW	4.22e-19

21	185	14.3	200	13	P79925	FIBROBLAST GROWTH FACT	2.90e-18
22	182	14.1	74	6	O77561	KERATINOCYTE GROWTH FA	1.22e-17
23	175	13.5	770	5	P91672	EGF HOMOLOG	3.42e-16
24	171	13.2	210	13	O57341	FIBROBLAST GROWTH FACT	2.25e-15
25	171	13.2	425	5	O76831	LET-756 PROTEIN	2.25e-15
26	168	13.0	204	13	O90696	FIBROBLAST GROWTH FACT	9.18e-15
27	160	12.4	216	4	O95750	FGF-19	3.74e-13
28	158	12.2	210	13	O42278	FIBROBLAST GROWTH FACT	9.36e-13
29	158	12.2	244	4	O14915	FIBROBLAST GROWTH FACT	9.36e-13
30	157	12.1	78	11	O35340	FIBROBLAST GROWTH FACT	1.48e-12
31	155	12.0	182	14	O92401	FGF-ACMNPV ORF32	3.68e-12
32	145	11.2	285	14	O9YMH2	FIBROBLAST GROWTH FACT	3.29e-10
33	128	9.9	73	6	O9Y573	FIBROBLAST GROWTH FACT	5.18e-07
34	109	8.4	822	1	O27154	CONSERVED PROTEIN	1.15e-03
35	102	7.9	82	6	O62682	FIBROBLAST GROWTH FACT	1.65e-02
36	101	7.8	211	1	O9EE7	211AA LONG HYPOTHETICA	2.49e-02
37	100	7.7	1223	2	O92NB5	130K-HMGD (FRAGMENT)	3.47e-02
38	100	7.7	1358	2	P96967	HEMAGGLUTININ	3.47e-02
39	100	7.7	1723	2	P72194	LYS-GINGIPAIN	3.47e-02
40	100	7.7	1723	2	P72197	LYS-GINGIPAIN	3.47e-02
41	100	7.7	1732	2	O51817	PORPHYRAIN	3.47e-02
42	100	7.7	1732	2	O52050	LYSINE SPECIFIC CYSTEI	3.47e-02
43	100	7.7	1732	2	O07442	LYSINE-SPECIFIC CYSTEI	3.47e-02
44	96	7.4	753	2	O51623	METHYL-ACCEPTING CHEMO	1.49e-01
45	95	7.3	232	2	O25299	CONSERVED HYPOTHETICAL	2.12e-01

ALIGNMENTS

RESULT	1	PRELIMINARY	PRT	196 AA
ID	P78443			
AC	P78443			
DT	01-MAY-1997 (TRENBLrel. 03, Created)			
DT	01-MAY-1997 (TRENBLrel. 03, Last sequence update)			
DT	01-NOV-1999 (TRENBLrel. 12, Last annotation update)			
DE	21 KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).			
GN	FGF2.			
OS	Homo sapiens (Human).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;			
OC	Eutheria; Primates; Catarrhini; Homnidae; Homo.			
RN	[1]			
RP	SEQUENCE FROM N.A.			
RX	MEDLINE; 89184522.			
RA	PRATS H., KAGHAD M., PRATS A.C., KLAGSBRUN M., LELIAS J.M.,			
RA	LIAUZON P., CHALON P., TAUBER J.P., AMARIC F., SMITH J.A., CAPUT D.;			
RT	"High molecular mass forms of basic fibroblast growth factor are			
RT	initiated by alternative CUG codons."			
RL	Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).			
RN	[2]			
RP	SEQUENCE OF 81-168 FROM N.A.			
RX	MEDLINE; 93038590.			
RA	WATSON R., ANTHONY F., PICKETT M., LAMBDEN P., MASSON G.M.,			
RA	THOMAS E.J.;			
RT	"Reverse transcription with nested polymerase chain reaction shows			
RT	expression of basic fibroblast growth factor transcripts in human			
RT	granulosa and cumulus cells from in vitro fertilisation patients."			
RL	Biochem. Biophys. Res. Commun. 187:1227-1231(1992).			
DR	EMBL; J04513; AAA52532.1; -			
DR	EMBL; S47380; AAD13853.1; -			
DR	HSSP; P09038; 1BFF.			
DR	PROSITE; PS00247; HBGF_FGF; 1.			
DR	PFAM; PF00167; FGF; 1.			
DR	PRINTS; PR00262; ILHBGF.			
DR	PRINTS; PR00263; HBGF_FGF.			
SQ	SEQUENCE 196 AA; 21203 MW; 49B75E39 CRC32;			
Query Match	35.7%;	Score 462;	DB 4;	Length 196;
Best Local Similarity	48.7%;	Pred. No. 2.02e-82;		
Matches	75;	Conservative 30;	Mismatches 42;	Indels 7; Gaps 2;
Db	50	LPALPEDGSGAFPPGHFKDKPKRLKCKNGGFFLRHPDGRVDSKSPHKLQQAEE 109		
Qy	26	VFSPAGARANGTLLDANYKKPKLLYCSNGGFLRLIPDGTVDGTRDSOHLQLSAES 85		

Db 110 RGVVSKGVCANRYLAMKEDGRLLKSCVTDCEFFERLESN-----NYNTYRSKYT-- 162
 QY 86 VGEYIKSTGTGYLAMDTDGLYGSOTPNCECLFLERLEENATPAPHYNTYISKHAEK 145
 Db 163 SWYVALKRTGYKLGSTGPGQKAILFLPMSAKS 196
 QY 146 NWFVGLKNGSKRGPRTHYGQKAILFLPVS 179

RESULT 2
 ID O77767 PRELIMINARY; PRT; 130 AA.
 AC O77767;
 DT 01-NOV-1998 (T-EMBLrel. 08, Created)
 DT 01-NOV-1998 (T-EMBLrel. 08, Last sequence update)
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 GN BFGF.
 OS Canis familiaris (Dog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
 OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-ADRENAL GLAND;
 RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;
 RT "The role of bFGF in canine Hemangiosarcoma";
 RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.
 DR EMBL; AF060562; AAC35912.1;
 DR HSSP; P09038; IBFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 FT NON_TER 1 130
 FT SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;
 Query Match 35.2%; Score 456; DB 6; Length 130;
 Best Local Similarity 53.3%; Pred. No. 5.88e-81;
 Matches 73; Conservative 21; Mismatches 36; Indels 7; Gaps 2;

Db 1 FKDKPKLYCKNGGFFLIHPDGRVDGVRKSDPHVQLQAEERGVVSIKVCANRYLAM 60
 QY 43 YKPKLYCKNGGFFLIHPDGRVDGVRKSDPHVQLQAEERGVVSIKVCANRYLAM 102
 Db 61 KEDGRLLKSCVTDCEFFERLESN-----NYNTYRSKYT--SWYVALKRTGYKLGPK 113
 QY 103 DTDGLYGSOTPNCECLFLERLEENATPAPHYNTYISKHAEKWNFVGLKNGSKRGPR 162
 114 TPGQKAILFLPMSAKS 130
 163 THYGQKAILFLPVS 179

RESULT 3
 ID P79706 PRELIMINARY; PRT; 101 AA.
 AC P79706;
 DT 01-MAY-1997 (T-EMBLrel. 03, Created)
 DT 01-MAY-1997 (T-EMBLrel. 03, Last sequence update)
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)
 DE BASIC FGF (FRAGMENT).
 OS Cynops pyrrhogaster (Japanese common newt).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
 OC Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE-EMBRYO;
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
 RA KANEDA T.;
 RT "Serial expression of the genes in a mesodermizing ectoderms of
 early Cynops gastrula";
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.
 DR EMBL; D89443; BAA13958.1;
 DR HSSP; P09038; 2BFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.

DR PFAM; PF00167; FGF; 1.
 FT NON_TER 1 101
 FT SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;
 Query Match 25.3%; Score 327; DB 13; Length 101;
 Best Local Similarity 50.9%; Pred. No. 4.69e-50;
 Matches 55; Conservative 18; Mismatches 28; Indels 7; Gaps 2;
 Db 1 PKRLCKNGGFFLIHPDGRVDGVRKSDPHVQLQAEERGVVSIKVCANRYLAMKDD 60
 QY 46 PKLYCSNGGFFLIHPDGRVDGVRKSDPHVQLQAEERGVVSIKVCANRYLAMKDD 105
 Db 61 GRMLAKWITDCEFFERLESN-----NYNTYRSKYT--WYVALKR 101
 QY 106 GLLYGSOTPNCECLFLERLEENATPAPHYNTYISKHAEKWNFVGLK 153

RESULT 4
 ID O07659 PRELIMINARY; PRT; 146 AA.
 AC O07659;
 DT 01-NOV-1996 (T-EMBLrel. 01, Created)
 DT 01-NOV-1996 (T-EMBLrel. 01, Last sequence update)
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)
 DE FIBROBLAST GROWTH FACTOR.
 GN BFGF.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC MEDLINE; 93246053.
 RA BORJA A.Z., ZELLER R., MEIJERS C.;
 RT "Expression of alternatively spliced bFGF first coding exons and
 RT antisense mRNAs during chicken embryogenesis";
 RL Dev. Biol. 157:110-118(1993).
 RN [2]
 RP SEQUENCE OF 52-85 FROM N.A.
 RX MEDLINE; 90382254.
 RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;
 RT "Fibroblast growth factor during mesoderm induction in the early chick
 RT embryo";
 RL Development 109:387-393(1990).
 DR EMBL; M95706; AAA48616.1;
 DR EMBL; X56804; CAA40139.1;
 DR HSSP; P09038; 2BFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HBGF.
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 22.5%; Score 291; DB 13; Length 146;
 Best Local Similarity 45.9%; Pred. No. 1.08e-41;
 Matches 50; Conservative 20; Mismatches 32; Indels 7; Gaps 2;
 Db 45 ERYSAMVQLQAEERGVVSIKVCANRYLAMKEDGRLLKSCVTDCEFFERLESN--- 101
 QY 71 DRSDQHIQLQAEERGVVSIKVCANRYLAMKEDGRLLKSCVTDCEFFERLESNATP 130
 Db 102 --NYNTYRSKYT--WYVALKRTGYKPGKTPGQKAILFLPMSAKS 146
 QY 131 APHYNTYISKHAEKWNFVGLKNGSKRGPRTHYGQKAILFLPVS 179

RESULT 5
 ID O42407 PRELIMINARY; PRT; 212 AA.
 AC O42407;
 DT 01-JAN-1998 (T-EMBLrel. 05, Created)
 DT 01-JUN-1998 (T-EMBLrel. 06, Last sequence update)
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)
 DE FIBROBLAST GROWTH FACTOR 10.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;

```

OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 97330690.
RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,
YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;
RT "The mesenchymal factor, FGF10, initiates and maintains the outgrowth
of the chick limb bud through interaction with FGF8, an apical
ectodermal factor."
RL Development 124:2235-2244(1997).
DR EMBL; D86333; BAA24945.1; -.
DR HSSP; P03968; 1BAR.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00263; HBGF0FG.
SQ SEQUENCE 212 AA; 23631 MW; C9AB1883 CRC32;

Query Match 20.9%; Score 270; DB 13; Length 212;
Best Local Similarity 34.4%; Pred. No. 6.87e-37;
Matches 53; Conservative 36; Mismatches 59; Indels 6; Gaps 5;

64 PSSAGRHVRSYHNLQGVYRKRL-Y-SYNYFLKIERKNGKVGSKENCPCFSEILEITSVE 121
||| : : : : : ||| : : : : : ||| : : : : : ||| : : : : :
27 PSPAGARANG-TLLDANYKKPKLLYCSNGGHFLRLPDGTGTRDSRSDQHLQLSAES 85
||| : : : : : ||| : : : : : ||| : : : : : ||| : : : : :

DB 122 IGVAVKSIKSYNIAMNKKKGVSKFNSDCKLKERIENGNT--YAS-LNWKHNGR 178
||| : : : : : ||| : : : : : ||| : : : : : ||| : : : : :
QY 86 VGEVYIKSTETGOYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYTYISKHAEK 145
||| : : : : : ||| : : : : : ||| : : : : : ||| : : : : :

DB 179 OMFVALNGRATKROKTRKNTSAHFLPMVMS 212
||| : : : : : ||| : : : : : ||| : : : : : ||| : : : : :
QY 146 NWFVLKNGSKCKRGRTHYQKAILFLPLPVSS 179
||| : : : : : ||| : : : : : ||| : : : : : ||| : : : : :

RESULT 6
ID Q16089 PRELIMINARY; PRT; 59 AA.
AC Q16089;
DT 01-NOV-1996 (TrEMBLrel. 01, Created)
DT 01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 94069734.
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
growth factor-1)-and cytokine genes in human cardiac allografts and T
cells."
RL Transplantation 56:1177-1182(1993).
DR EMBL; S67294; AAB29059.1; -.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 59
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 20.6%; Score 266; DB 4; Length 59;
Best Local Similarity 92.3%; Pred. No. 5.55e-36;
Matches 36; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

DB 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQH 56
| : : : : : | : : : : : | : : : : : | : : : : :
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQH 76
| : : : : : | : : : : : | : : : : : | : : : : :

RESULT 7
ID Q16588 PRELIMINARY; PRT; 60 AA.
AC Q16588;
DT 01-NOV-1996 (TrEMBLrel. 01, Created)
DT 01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).

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OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 94069734.
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
growth factor-1) and cytokine genes in human cardiac allografts and T
cells."
RL Transplantation 56:1177-1182(1993).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 92202857.
RA LI Y.L., KHA H., GOLDEN J.A., MIGCHELSEN A.A.J., GOETZ E.J.,
TURCK E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
splicing acts like an antagonist."
RL J. Exp. Med. 175:1073-1080(1992).
DR EMBL; S67292; AAB29058.1; -.
DR EMBL; X65779; CAA46662.1; -.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 60
SQ SEQUENCE 60 AA; 6697 MW; 6CCC7DFF CRC32;

Query Match 20.6%; Score 267; DB 4; Length 60;
Best Local Similarity 87.8%; Pred. No. 3.29e-36;
Matches 36; Conservative 2; Mismatches 3; Indels 0; Gaps 0;

DB 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQH 58
| : : : : : | : : : : : | : : : : : | : : : : :
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQH 78
| : : : : : | : : : : : | : : : : : | : : : : :

RESULT 8
ID Q54837 PRELIMINARY; PRT; 70 AA.
AC Q54837;
DT 01-JUN-1998 (TrEMBLrel. 06, Created)
DT 01-JUN-1998 (TrEMBLrel. 06, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX STRAIN-C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF012926; AAB94020.1; -.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 70
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;

Query Match 20.4%; Score 264; DB 11; Length 70;
Best Local Similarity 97.2%; Pred. No. 1.58e-35;
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

DB 35 GNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQH 70
| : : : : : | : : : : : | : : : : : | : : : : :
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQH 76
| : : : : : | : : : : : | : : : : : | : : : : :

RESULT 9
ID Q60487 PRELIMINARY; PRT; 115 AA.
AC Q60487;
DT 01-NOV-1996 (TrEMBLrel. 01, Created)
DT 01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Cavia porcellus (Guinea pig).

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Query Match	18.1%	Score 234;	DB 13;	Length 245;
Best Local Similarity	32.3%;	Pred. No. 8.13e-29;		
Matches	42;	Conservative 31;	Mismatches 53;	Indels 4;
Db 194 PSSHFVPKPI 203				
Qy 168 KAILFLPLPV 177				
RESULT 13				
ID O95830	PRELIMINARY;	PRT;	192 AA.	
AC O95830				
DT 01-MAY-1999 (TReMBLrel. 10, Created)				
DT 01-MAY-1999 (TReMBLrel. 10, Last sequence update)				
DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)				
DE FIBROBLAST GROWTH FACTOR 13 ISOFORM 1B.				
GN FGF13				
OS Homo sapiens (Human)				
OC Eukaryota; Metazoa; Chordata; Vertebrata; Mammalia;				
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.				
RN [1]				
RP SEQUENCE FROM N.A.				
RA GECZ J., BAKER E., DONNELLY A., MING J.E., MCDONNALD-MCGINN D.M.,				
RA SPINNER N.B., ZACKAI E.H., SUTHERLAND G.R., MULLEY J.C.;				
RT "Fibroblast growth factor homologous factor 2 (FGF2): gene structure,				
RT expression and mapping to the Borjeson-Forsman-Lehmann syndrome				
RT region in Xq26 delineated by a duplication breakpoint in a BFLS-like				
RT patient.";				
RL Hum. Genet. 104:56-63(1999).				
DR EMBL; AF100144; AAD16401.1;				
DR HSP; P03968; IAF.				
DR PROSITE; PS00247; HGF_FGF; 1.				
SQ SEQUENCE 192 AA; 21580 MW; 9AD05A36 CRC32;				
Query Match	18.1%;	Score 234;	DB 4;	Length 192;
Best Local Similarity	33.1%;	Pred. No. 8.13e-29;		
Matches	43;	Conservative 30;	Mismatches 53;	Indels 4;
Db 20 LYSRQGYH-LQLQADGTDGTTKEDSSYTLFNLIPVGLRVVAIQGVOTKLYLAMNSEGYL 78				
Qy 49 LYCSNGGHEFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGYLAMDTDGLL 108				
Db 79 YTSLETPPECKESVFENYV-VT-YSSMIYRQOQSGRWYLGINKKEGIMKGNHVKKNK 136				
Qy 109 YGSOTPNEECLFLERLEENATPAPHYNTYISKKH-AEKNWFVGLKNGSKRGPRTHYQ 167				
Db 137 PAAHFLPKPL 146				
Qy 168 KAILFLPLPV 177				
Query Match	18.1%;	Score 234;	DB 4;	Length 192;
Best Local Similarity	33.1%;	Pred. No. 8.13e-29;		
Matches	43;	Conservative 30;	Mismatches 53;	Indels 4;
Db 20 LYSRQGYH-LQLQADGTDGTTKEDSSYTLFNLIPVGLRVVAIQGVOTKLYLAMNSEGYL 78				
Qy 49 LYCSNGGHEFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGYLAMDTDGLL 108				
Db 79 YTSLETPPECKESVFENYV-VT-YSSMIYRQOQSGRWYLGINKKEGIMKGNHVKKNK 136				
Qy 109 YGSOTPNEECLFLERLEENATPAPHYNTYISKKH-AEKNWFVGLKNGSKRGPRTHYQ 167				
Db 137 PAAHFLPKPL 146				
Qy 168 KAILFLPLPV 177				
Query Match	18.1%;	Score 234;	DB 4;	Length 192;
Best Local Similarity	33.1%;	Pred. No. 8.13e-29;		
Matches	43;	Conservative 30;	Mismatches 53;	Indels 4;
Db 20 LYSRQGYH-LQLQADGTDGTTKEDSSYTLFNLIPVGLRVVAIQGVOTKLYLAMNSEGYL 78				
Qy 49 LYCSNGGHEFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGYLAMDTDGLL 108				
Db 79 YTSLETPPECKESVFENYV-VT-YSSMIYRQOQSGRWYLGINKKEGIMKGNHVKKNK 136				
Qy 109 YGSOTPNEECLFLERLEENATPAPHYNTYISKKH-AEKNWFVGLKNGSKRGPRTHYQ 167				
Db 137 PAAHFLPKPL 146				
Qy 168 KAILFLPLPV 177				
Query Match	18.1%;	Score 234;	DB 4;	Length 192;
Best Local Similarity	33.1%;	Pred. No. 8.13e-29;		
Matches	43;	Conservative 30;	Mismatches 53;	Indels 4;
Db 20 LYSRQGYH-LQLQADGTDGTTKEDSSYTLFNLIPVGLRVVAIQGVOTKLYLAMNSEGYL 78				
Qy 49 LYCSNGGHEFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGYLAMDTDGLL 108				
Db 79 YTSLETPPECKESVFENYV-VT-YSSMIYRQOQSGRWYLGINKKEGIMKGNHVKKNK 136				
Qy 109 YGSOTPNEECLFLERLEENATPAPHYNTYISKKH-AEKNWFVGLKNGSKRGPRTHYQ 167				
Db 137 PAAHFLPKPL 146				
Qy 168 KAILFLPLPV 177				
Query Match	18.1%;	Score 234;	DB 4;	Length 192;
Best Local Similarity	33.1%;	Pred. No. 8.13e-29;		
Matches	43;	Conservative 30;	Mismatches 53;	Indels 4;
Db 20 LYSRQGYH-LQLQADGTDGTTKEDSSYTLFNLIPVGLRVVAIQGVOTKLYLAMNSEGYL 78				
Qy 49 LYCSNGGHEFLRLPDGTVGDRSDQHIQLQLSAESVGEVIKSTETGYLAMDTDGLL 108				
Db 79 YTSLETPPECKESVFENYV-VT-YSSMIYRQOQSGRWYLGINKKEGIMKGNHVKKNK 136				

Search completed: Tue Aug 29 16:16:54 2000
Job time : 116 secs.

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2



M P S R E H
***** (TM)

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:44:29 2000; MasPar time 7.13 Seconds
Tabular output not generated. 581.738 Million cell updates/sec

Title: >US-09-121-017B-3
Description: (1-175)-from-US0917017B.pep
Perfect Score: 1265
Sequence: 1 MSRGAGRVOGTQLQALVFLGV.....PRTHYGOKAILFLPLPVSSD 175

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: a-geneseq36
1:geneseq

Statistics: Mean 31.422; Variance 128.911; scale 0.244

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	986	77.9	140	1 R25914	Human acidic fibroblas	2.28e-87
2	986	77.9	140	1 R34497	Human acidic Fibroblas	2.28e-87
3	986	77.9	140	1 P90068	Human acid fibroblast	2.28e-87
4	986	77.9	140	1 R74647	Human recombinant aFGF	2.28e-87
5	986	77.9	140	1 W04806	Human acidic fibroblas	2.28e-87
6	986	77.9	140	1 P70995	Sequence of human prot	2.28e-87
7	986	77.9	141	1 R10577	Human acidic fibroblas	2.28e-87
8	986	77.9	151	1 R05789	Human aFGF encoded by	2.28e-87
9	986	77.9	151	1 W92283	Human beta-endothelial	2.28e-87
10	986	77.9	154	1 W04805	Human beta-endothelial	2.28e-87
11	986	77.9	154	1 W06816	Human endothelial cell	2.28e-87
12	986	77.9	154	1 W75414	Human beta-endothelial	2.28e-87
13	986	77.9	155	1 P94037	Human acidic fibroblas	2.28e-87
14	986	77.9	155	1 R70812	FGF-1.	2.28e-87
15	986	77.9	155	1 P70482	Sequence encoded by co	2.28e-87
16	986	77.9	155	1 R80776	Fibroblast growth fact	2.28e-87
17	986	77.9	155	1 W53022	Fibroblast growth fact	2.28e-87
18	986	77.9	155	1 W75411	Fibroblast growth fact	2.28e-87
19	986	77.9	155	1 W75415	Human endothelial cell	2.28e-87
20	986	77.9	155	1 W92291	Human endothelial cell	2.28e-87
21	986	77.9	165	1 W05785	Human BEGF encoded by	2.28e-87
22	986	77.9	168	1 W06818	Human endothelial cell	2.28e-87
23	983	77.7	134	1 W75413	Human alpha-endothelia	4.64e-87

24	983	77.7	134	1 W92282	Human alpha-endothelia	4.64e-87
25	983	77.7	134	1 W04807	Human alpha-endothelia	4.64e-87
26	975	77.1	156	1 W71383	Fibroblast growth fact	3.09e-86
27	972	76.8	135	1 W06817	Human endothelial cell	6.30e-86
28	960	75.9	132	1 R13327	9 N-terminal residue d	1.08e-84
29	960	75.9	132	1 R25418	aFGF mutetin #2.	1.08e-84
30	955	75.5	155	1 R25570	Recombinant human Ala1	3.53e-84
31	955	75.5	155	1 W00561	Human (Gly93) aFGF ana	3.53e-84
32	950	75.1	140	1 R65935	Fibroblast growth fact	1.15e-83
33	938	74.2	129	1 R25419	aFGF mutetin #3.	1.98e-82
34	938	74.2	129	1 R13328	12 N-terminal residue	1.98e-82
35	923	73.0	154	1 R05315	Human acidic fibroblas	6.87e-81
36	917	72.5	140	1 P90069	Bovine acid fibrobla	2.84e-80
37	917	72.5	140	1 R74648	Bovine recombinant aFG	2.84e-80
38	917	72.5	140	1 R13030	Brain-derived acidic f	2.84e-80
39	917	72.5	140	1 R65934	Bovine fibroblast grow	2.84e-80
40	917	72.5	140	1 R34496	Bovine acid fibroblas	2.84e-80
41	917	72.5	140	1 R25915	Human acidic fibroblas	2.84e-80
42	917	72.5	154	1 P90074	Recombinant human muta	2.84e-80
43	906	71.6	141	1 R25569	Recombinant bovine Ala	3.83e-79
44	906	71.6	141	1 W00560	Bovine (Ala47-Gly93) a	3.83e-79
45	900	71.1	136	1 W01747	Chimeric acid/basic fi	1.58e-78

ALIGNMENTS

RESULT 1
ID R25914 standard; peptide; 140 AA.
AC R25914;
DE 26-JAN-1993 (first entry)
KW Human acidic fibroblast growth factor.
KW viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;
KW herpes varicella; herpes zoster; cytomegalovirus; influenza;
KW human respiratory syncytial virus; Semliki Forest virus; HIV;
KW human immunodeficiency virus; Moloney Sarcoma virus.
OS Homo sapiens.
PN EP-497341-A.
PD 05-AUG-1992.
PF 30-JAN-1992; 101541.
PR 31-JAN-1991; GB-002145.
PR 09-JAN-1992; GB-000410.
PA (FARM) FARMITALIA ERBA SRL CARLO.
PI Battistini C, Carminati P, Garofano L, Mazue G, Ungherli D;
DI WPI; 92-260792/32.
PT Synergistic antiviral composition contains aFGF and sulphated
PT Polysaccharide - for treating viral infections e.g. HSV-1 and -2,
PT Cytomegalovirus, HIV, influenza virus etc.
PS Disclosure; Page 4; 20pp; English.
CC This sequence represents acidic fibroblast growth factor (aFGF).
CC aFGF, or its fragments may be used in a synergistic compen. with an
CC antivirally active sulphated polysaccharide, and one or more
CC excipients. The compen. may be used to control herpes simplex virus
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; Influenza;
CC human respiratory syncytial virus; Semliki Forest virus; HIV or
CC Moloney Sarcoma virus. The combination of aFGF with sulphated
CC polysaccharide is found to have a greater antiviral activity than
CC expected for an additive effect. See also R25913-5.
SQ Sequence 140 AA;

Query Match	77.9%;	Score 986;	DB 1;	Length 140;
Best Local Similarity	97.8%;	Pred. No. 2.28e-87;		
Matches	135;	Conservative 1;	Mismatches 2;	Indels 0;
Gaps	0;			
Db	3	LPPGNTKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAEVYIKSTETG	62	
QY	38	LDLADKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAEVYIKSTETG	97	
Db	63	QYLANDTDGLLYGSGTTPNEECFLERLEENHYNTYISKHAENWVGLKKNKSGCKRGPR	122	
QY	98	QYLANDTDGLLYGSGTTPNEECFLERLEENHYNTYISKHAENWVGLKKNKSGCKRGPR	157	
Db	123	THYGOKAILFLPLPVSSD	140	

QY 158 THYGOKAILFLPLPVSSD 175

RESULT

ID R34497 standard; protein; 140 AA.
AC R34497;
DT 06-AUG-1993 (first entry)
DE Human acidic fibroblast growth factor.
KW aFGF; mutagen; glycosylation site; glycoprotein.
OS Homo sapiens.
PN J05076356-A.
PD 30-MAR-1993.
PE 30-MAY-1991; 127435.
PF 31-MAY-1990; JP-143388.
PG (TAKE) TAKEDA CHEM IND LTD.
PH WPI; 93-139564/17.
PI FGF mutagen prep. useful for therapy of burn or thrombosis - by
PT transformation of lymphocyte-contained animal cell by vector
PT contg. DNA encoding FGF mutagen.
PT Disclosure; Page 3; 23pp; Japanese.
PS The invention covers mutants of FGF (esp. bFGF) which contain at
CC least one glycosylation site. The mutants can be used to treat burns
CC and thrombosis.
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 97
Db 63 QYLAMTDGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122
QY 98 QYLAMTDGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 123 THYGOKAILFLPLPVSSD 140
QY 158 THYGOKAILFLPLPVSSD 175

RESULT

ID P90068 standard; protein; 140 AA.
AC P90068;
DT 1-NOV-1989 (first entry)
DE Human acid fibroblast growth factor
DE Human acid fibroblast growth factor; mutant.
OS Homo sapiens
PN EP-319052-A.
PD 14-JUN-1989.
PE 14-OCT-1988; 202306.
PF 22-OCT-1987; EP-244431.
PG (MERI) Merck and Co.
PH Thomas Jnr KA, Linemeyer DL;
PI WPI; 89-167092/23.
PT Mutant acidic fibroblast growth factor
PT - used for promoting repair of soft tissue, musculoskeletal
PT tissue or vascular or nerve tissue and plasminogen
PT activator prodn.
PS Disclosure; page 4; 36pp; English.
CC Amino acid sequence of human acidic fibroblast growth
CC factor (aFGF). The patent claims mutant forms which have
CC increased biological activity with(out) heparin, and promote
CC cell growth.
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 97

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 97
Db 63 QYLAMTDGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122
QY 98 QYLAMTDGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 123 THYGOKAILFLPLPVSSD 140
QY 158 THYGOKAILFLPLPVSSD 175

RESULT

ID R74647 standard; protein; 140 AA.
AC R74647;
DT 25-SEP-1995 (first entry)
DE Human recombinant aFGF.
KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis;
KW mitogen.
OS Homo sapiens.
PN US5401852-A.
PD 28-MAR-1995.
PE 24-DEC-1984; 685923.
PF 24-DEC-1984; US-685923.
PG 12-SEP-1985; US-774359.
PH 30-MAY-1986; US-868473.
PI 11-JUL-1986; US-884460.
PT 04-JUN-1987; US-054991.
PT 04-MAY-1988; US-190293.
PR 08-FEB-1991; US-654397.
PR 25-SEP-1991; US-765472.
PR 25-SEP-1992; US-951365.
PA (MERI) MERCK & CO INC.
PI GImenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;
PI WPI; 95-138983/18.
PT New recombinant human acidic fibroblast growth factor - used to
PT promote cell growth, to promote wound healing, for vascular
PT grafts and blood vessel repair
PT Claim 2; Column 30; 25pp; English.
CC Oligonucleotides were synthesized on the basis of the amino acid
CC sequence of bovine acidic fibroblast growth factor (aFGF) and
CC used to produce a synthetic gene (given in 088233) incorporating
CC codons preferred by E. coli or mammalian cells, unique cloning
CC sites, etc. This synthetic gene was mutagenized to obtain a gene
CC encoding a human recombinant aFGF (R74647) having activity
CC equivalent to the native protein.
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGVYIKSTETG 97
Db 63 QYLAMTDGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122
QY 98 QYLAMTDGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 123 THYGOKAILFLPLPVSSD 140
QY 158 THYGOKAILFLPLPVSSD 175

RESULT

ID W04806 standard; protein; 140 AA.
AC W04806;
DT 29-DEC-1996 (first entry)
DE Human acidic fibroblast growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor; ss.
OS Homo sapiens.

PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON) RHONE POULENC RORER PHARM INC.
PI Burgess W. Maciag T;
DR WPI: 96-412132/41.
DR N-PSDB: T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PS Disclosure: Fig 8; 28pp; English.
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kd can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 63 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157

Db 123 THYGOKAILFLPLPVSSD 140
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 6
ID P70995 standard; protein; 140 AA.
AC P70995;
PT Sequence of human proteinaceous factor (PFI) with mitogenic activity.
PT Cell growth promoter; mitogen; vascularisation; wound healing.
PT Homo sapiens.
FH Key Location/Qualifiers
FT misc_difference 140
FT /label= Asp-OH
FT EP-241136-A.
PN 14-OCT-1987.
PF 06-MAR-1987; 301969.
PR 07-MAR-1986; US-838096.
PA (HARD) HARVARD COLLEGE.
PI Lobb RR, Harper JW, Strydom DJ;
DR WPI: 87-285995/41.
DR Mitogenic polypeptide isolated from human brain tissue - useful
PT for increasing vascular effect in eg wound healing, or
PT generating endothelial cell linings for vascular prostheses, etc.
PS Claim 3; Page 1; 31pp; English.
CC The PF of the invention was obtd. from human brain tissue. It has a
CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
CC affinity for heparin. PFI and fragments are useful for promoting the
CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
CC generating endothelial cell linings for vascular prostheses (all
CC claimed). The polypeptides are useful for increasing vascularisation.
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;

Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 63 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157

Db 123 THYGOKAILFLPLPVSSD 140
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 7
ID R10527 standard; Protein; 141 AA.
AC R10527;
DT 15-APR-1991 (first entry)
DE Human acidic fibroblast growth factor gene.
KW aFGF; antibody; antigen; cancer; ss.
OS Homo sapiens.
FH Key Location/Qualifiers
FT region 2..12
FT /label= A
FT region 56..67
FT /label= B
FT region 104..114
FT /label= C
FT region 132..141
FT /label= D
PN J02306996-A.
PD 20-DEC-1990.
PF 03-JUL-1989; 172542.
PR 04-JUL-1988; JP-166275.
PR 03-JUL-1989; JP-172542.
PA (TAKE) TAKEDA CHEMICAL IND KK.
DR WPI: 91-040150/06.
DR N-PSDB: Q10399.
PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by
PT using complex of partial peptide(s) of acid fibroblast growth
PT factor and protein as antigen.
PS Disclosure: Fig 1; 19pp; Japanese.
CC The was deduced from a gene used to produce recombinant aFGF.
CC Peptides derived from the protein, esp. from A-D can be used to as
CC antigens to produce anti-aFGF antibodies. The peptides must
CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
CC (claim 8). The abs can be used for immunochemically measuring aFGF,
CC and for purifying aFGF. They are useful as reagents in the diag-
CC nosis of various cancers or diseases of the CNS. Purified aFGF
CC has wound healing and nerve cell proliferating properties.
SQ Sequence 141 AA;

Query Match 77.9%; Score 986; DB 1; Length 141;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 4 LPPGNYKKPKLLYCSNGGHHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 63
QY 38 LLDANYKKPKLLYCSNGGHHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 64 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 123
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157

Db 124 THYGOKAILFLPLPVSSD 141
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 8

Burgess W, Drohan WN, Jaye M, Maciag T;
WPI; 99-069734/06.
DNA encoding a cleavable signal peptide and an endothelial cell
growth factor - useful for producing recombinant endothelial cell
growth factor proteins
Clam J; Column 16; 23pp; English.

This represents the amino acid sequence of human beta-endothelial cell growth factor (ECGF). The invention is directed to DNA encoding alpha- or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a cleavable signal peptide and an ECGF where removal of the signal peptide yields a mature form of the ECGF. The DNA is used to produce recombinant ECGF proteins, which can be used in treatments to repair or regenerate blood vessels or other structures lined with endothelial cells.
Sequence 154 AA;

Query Match 77.9%; Score 986; DB 1; Length 154;
Best Local Similarity 97.8%; Pred.No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKPKLLYCSNGGHFLRILPDGVDTGRSDQHIOQLSASVGEVIKSTETG 76
| : |
Qy 38 LLDANYKPKLLYCSNGGHFLRILPDGVDTGRSDQHIOQLSASVGEVIKSTETG 97
| : |

Db 77 QYLAMTDGLLYGSTPNDECLFLERLEENHYNTYSKKHAEKNWFVLKKGNSCKRGPR 136
| : |
Qy 98 QYLAMTDGLLYGSTPNDECLFLERLEENHYNTYSKKHAEKNWFVLKKGNSCKRGPR 157
| : |

Db 137 THYGQAKILFLPLPVSSD 154
| : |
Qy 158 THYGQAKILFLPLPVSSD 175
| : |

RESULT 10
ID W04805 standard; Protein; 154 AA.
AC W04805;
AD 29-DEC-1996 (first entry)
DE Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
OS Fcγ; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PT (RHON) RHONE POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI; 96-412132/41.
DN N-PDSB; T37503.
DT Isolated, purified, biologically active bovine beta endothelial cell
growth factor - useful to regenerate or treat damaged blood vessels
disclosure; Fig 8 - 28pp; English.
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 154 AA;

Query Match 77.9%; Score 986; DB 1; Length 154;
Best Local Similarity 97.8%; Pred.No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKPKLLYCSNGGHFLRILPDGVDTGRSDQHIOQLSASVGEVIKSTETG 76
| : |

QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 137 THYGOKAILFLPLPVSSD 154
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 11
ID W06816 standard; protein; 154 AA.
AC W06816;
DT 17-MAR-1997 (first entry)
DE Human endothelial cell growth factor-beta.
KW Endothelial cell growth factor-beta; ECGF-beta.
OS Homo sapiens.
US5571790-A.
05-NOV-1996.
03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, Maciag T;
DR WPI; 96-503421/50.
DR N-PSDB; T45983.
PT Recombinant human endothelial cell growth factors - for treating
PT damaged blood vessels, etc.
PS Claim 1; Column 16; 22pp; English.
CC Human recombinant endothelial cell growth factors (ECGF) beta
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
CC They can be produced in transformed prokaryotic or eukaryotic host
CC cells using DNA sequences (T45983 and T45984, respectively) derived
CC from the complete human ECGF cDNA (T45985). Large quantities of
CC the ECGFs are produced by culturing the host cells and recovering
CC the proteins. ECGFs have utility in the growth and amplification
CC of endothelial cells in culture. They can potentially be used to
CC treat damaged blood vessels and other endothelial cell-lined
CC structures, and also have diagnostic applns.
SQ Sequence 154 AA;

Query Match 77.9%; Score 986; DB 1; Length 154;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 137 THYGOKAILFLPLPVSSD 154
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 12
ID W75414 standard; protein; 154 AA.
AC W75414;
DT 02-MAR-1999 (first entry)
DE Human beta-endothelial cell growth factor.
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;
OS Hybridisation; bovine; wound healing; prosthetic device.
US5827826-A.
27-OCT-1998.

Query Match 77.9%; Score 986; DB 1; Length 154;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 137 THYGOKAILFLPLPVSSD 154
QY 158 THYGOKAILFLPLPVSSD 175

PF 04-NOV-1996; 743261.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, Maciag T;
DR WPI; 98-594032/50.
PT Compositions for promoting wound healing - containing endothelial
PT cell growth factor polypeptides
PS Claim 1; Column 16; 23pp; English.
CC This sequence represents the amino acid sequence of the mature human
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
CC is identical to the alpha-ECGF but the beta sequence contains an extra
CC 20 N-terminal amino acids. The sequence was isolated from a human brain
CC stem cell cDNA library using a probe designed based on fragments of the
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
CC compositions for promoting wound healing. ECGF is also used to grow
CC cells on a prosthetic device.
SQ Sequence 154 AA;

Query Match 77.9%; Score 986; DB 1; Length 154;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 137 THYGOKAILFLPLPVSSD 154
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 13
ID P94037 standard; protein; 155 AA.
AC P94037;
DT 25-JUN-1990 (first entry)
DE Human acidic fibroblast growth factor.
KW Acidic fibroblast growth factor.
OS Homo sapiens.
PN EP-298723-A.
PD 11-JAN-1989.
PF 06-JUL-1988; 306158.
PR 07-JUL-1987; US-070797.
PA (BIOT-) Biotechn Res Assoc.
PI Fiddes JC, Abraham JA, Protter A;
DR WPI; 89-009785/02.
DR N-PSDB; N93088.
PT Recombinant DNA encoding new fibroblast growth factor
PT analogues - useful eg for accelerating wound healing and
PT to control neovascularisation.
PS Disclosure; p; English.
CC See also P94038.
SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 77
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97
Db 78 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 137

QY 98 QYLAAMDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 138 THYGQKAILFLPLPVSSD 155
QY 158 THYGQKAILFLPLPVSSD 175

RESULT 14

ID R70812 standard; protein; 155 AA.
AC R70812;
DT 01-SEP-1995 (first entry)
DE FGF-1.
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
OS Homo sapiens.
FH Key Location/Qualifiers
FT misc_difference 31
FT misc_difference 132 /note= "Cys may be replaced by Ser"
FT misc_difference 132 /note= "Cys may be replaced by Ser"
W09503831-A.
08-FEB-1995.
PF 27-JUL-1994; U08511.
PR 02-AUG-1993; US-099924.
PR 29-OCT-1993; US-145829.
PA (PR12-) PRIZM PHARM INC.
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.
PI Baird AJ, Lappi DA, Sosnowski BA;
DR WPI; 95-082038/11.
PT New monogenic preparations of cytotoxic conjugates and DNA -
PT contain fibroblast growth factors and cytotoxic agents for
PT treating FGF conditions such as tumours, diabetes and rheumatoid
PT arthritis.
PS Disclosure; page 108-109; 128pp; English.
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced
CC by conservative Ser substitutions. The fusion proteins are potent
CC cytotoxic agents to cells bearing the FGF receptor.
SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 77
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 97
78 QYLAAMDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 137
QY 98 QYLAAMDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 138 THYGQKAILFLPLPVSSD 155
QY 158 THYGQKAILFLPLPVSSD 175

RESULT 15

ID P70482 standard; Protein; 155 AA.
AC P70482;
DT 13-MAY-1991 (first entry)
DE Sequence encoded by complete cDNA sequence of human endothelial
DE cell growth factor (ECGF).
KW Endothelial cell regeneration; blood vessel regeneration.
OS Homo sapiens.
FH Key Location/Qualifiers
FT protein 2..15
FT /label= Beta ECGF
FT protein 16..21
FT /label= Acidic FGF
FT protein 22..155
FT /label= Alpha ECGF

PN W08705332-A.
PD 11-SEP-1987.
PF 02-MAR-1987; U00425.
PR 03-MAR-1986; US-835594.
PR 26-MAR-1987; ES-000812.
PA (MELO-) MELOY LAB INC.
PA (RORE-) RORER BIOTECHN INC.
PA (RORE-) RORER.
PA BIOTECH INC.
PI Jaye M, Burgess W, Maciag T, Drohan W;
DR WPI; 87-264128/37.
DR N-PSDB; N70788
PT Human endothelial cell growth factor - produced by recombinant
PT DNA techniques, useful for wound healing
PS Example; Fig 8; 43pp; English.
CC To screen the human brain stem cDNA library for clones contg. ECGF
CC inserts, a specific oligonucleotide was designed. This
CC oligonucleotide was based upon a partial AA sequence analysis of
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
CC forth for comparison the AA sequence of cyanogen bromide-cleaved
CC bovine alpha and beta ECGF (P70834). The two clones that were
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
CC nucleotide sequence of these clones and the AA sequence deduced from
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;
Best Local Similarity 97.8%; Pred. No. 2.28e-87;
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 77
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 97
Db 78 QYLAAMDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 137
QY 98 QYLAAMDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 157
Db 138 THYGQKAILFLPLPVSSD 155
QY 158 THYGQKAILFLPLPVSSD 175

Search completed: Tue Aug 29 15:45:03 2000
Job time : 34 secs.

Result No.	Query			DB	ID	Description	Pred. No.
	Score	Match	Length				
1	986	77.9	155	1	A33655	acidic fibroblast gro	6.25e-19
2	969	76.6	155	1	A60721	acidic fibroblast gro	6.16e-19
3	966	76.4	155	2	D37360	acidic fibroblast gro	3.12e-19
4	966	76.4	155	2	S04147	acidic fibroblast gro	3.12e-19
5	955	75.5	152	2	JH0476	acidic fibroblast gro	1.19e-18
6	917	72.5	155	1	GRBOA	acidic fibroblast gro	9.63e-18
7	916	72.4	155	2	A60130	acidic fibroblast gro	9.63e-18
8	906	71.6	155	2	JW0053	fibroblast growth fac	3.62e-17
9	530	41.9	189	2	GR834	basic fibroblast grow	2.16e-9
10	524	41.4	157	1	A48808	basic fibroblast grow	4.91e-89
11	517	40.9	146	1	S00185	basic fibroblast grow	1.87e-87
12	517	40.9	210	2	D32398	basic fibroblast grow	1.87e-87
13	513	40.6	154	2	A31674	basic fibroblast grow	1.49e-86
14	508	40.2	154	2	C37360	basic fibroblast grow	2.00e-85
15	505	39.9	164	2	S31622	basic fibroblast grow	9.45e-85
16	493	39.0	155	1	A40117	basic fibroblast grow	4.73e-82
17	473	37.4	137	2	I46711	fibroblast growth fac	1.44e-77
18	350	27.7	208	2	A48137	fibroblast growth fac	1.85e-50
19	350	27.7	208	2	S66486	fibroblast growth fac	1.85e-50
20	332	26.2	207	2	JC5941	fibroblast growth fac	1.40e-46
21	327	25.8	207	2	JC5940	fibroblast growth fac	1.65e-45
22	303	24.0	194	2	J49501	keratinocyte growth f	2.14e-40
23	300	23.7	194	1	A36301	fibroblast growth fac	9.25e-40


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Db 138 THYGQRAILFLPLPVSSD 155
|||||
QY 158 THYGQRAILFLPLPVSSD 175

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999

ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-I gene and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 76.6%; Score 969; DB 1; Length 155;
Best Local Similarity 95.7%; Pred. No. 6.16e-192;
Matches 132; Conservative 2; Mismatches 4; Indels 0; Gaps 0;

Db 18 LPPGNYKPKLLYCSNGHFLRLPDGTVDRSDQHIQLQLSAESAGEVYIKGTGTG 77
|:|||||
QY 38 LLDANVKKPKLLYCSNGHFLRLPDGTVDRSDQHIQLQLSAESAGEVYIKGTGTG 97
|:|||||

Db 78 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPR 137
|||||
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPR 157
|||||

Db 138 THYGQRAILFLPLPVSSD 155
|||||
QY 158 THYGQRAILFLPLPVSSD 175

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change 16-Jul-1999

ACCESSIONS D37360; JC5231
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

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#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 76.4%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.12e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGHFLRLPDGTVDRSDQHIQLQLSAESAGEVYIKGTGTGOYL 80
:|||||
QY 41 ANYKPKLLYCSNGHFLRLPDGTVDRSDQHIQLQLSAESAGEVYIKGTGTGOYL 100
:|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
QY 101 AMDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 160
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
QY 161 GQKAILFLPLPVSSD 175

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 16-Jul-1999

ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 76.4%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.12e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGHFLRLPDGTVDRSDQHIQLQLSAESAGEVYIKGTGTGOYL 80
:|||||
QY 41 ANYKPKLLYCSNGHFLRLPDGTVDRSDQHIQLQLSAESAGEVYIKGTGTGOYL 100
:|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
QY 101 AMDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 160
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
QY 161 GQKAILFLPLPVSSD 175

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#cross-references MUID:92062117 fibroblast growth factor (aFGF) from porcine heart.
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
SUMMARY
length 152 #checksum 1124
Query Match 75.5%; Score 955; DB 2; Length 152;
Best Local Similarity 95.6%; Pred. No. 1.19e-188;
Matches 129; Conservative 2; Mismatches 4; Indels 0; Gaps 0;
Db 18 LPPGNYKPKLLYCSNGHFIILPDGTVDGTRDRSQHQLQLSASVGEVIKSTETG 77
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 38 LLDYNYKPKLLYCSNGHFIILPDGTVDGTRDRSQHQLQLSASVGEVIKSTETG 97
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 78 QYLANDTSGLLYSGTSECLFLERLEENHYNTYTSKKHAEKNFVGLKNGSKRGPR 137
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 98 QYLANDTSGLLYSGTSECLFLERLEENHYNTYTSKKHAEKNFVGLKNGSKRGPR 157
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 138 THYGOKAILFLPLPV 152
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 158 THYGOKAILFLPLPV 172
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
RESULT 6
ENTRY GKBOA #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
CESSIONS JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
JH0613
REFERENCE Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts.
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S02065
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S02065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE A94281
#authors Glimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
##molecule_type protein
##residues 2-155 #label BUR
##note this form was designated beta endothelial cell growth factor

#accession C25043
##molecule_type protein
##residues 16-155 #label BU2
##note this form was designated acidic fibroblast growth factor

#accession A25043
##molecule_type protein
##residues 22-155 #label BU3
##note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
Strydom, D.J.; Harper, J.W.; Lobb, R.R.
Biochemistry (1986) 25:945-951
Amino acid sequence of bovine brain derived class 1
heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
##molecule_type protein
##residues 16-155 #label STR

REFERENCE
A60884
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.;
DiSalvo, J.
J. Protein Chem. (1987) 6:163-171
Primary structure and mitogenic and angiogenic activities of
brain-derived acidic fibroblast growth factor.

#accession A60884
##molecule_type protein
##residues 16-155 #label THO

REFERENCE
A37892
Kuo, M.D.; Huang, S.S.; Huang, J.S.
J. Biol. Chem. (1990) 265:16455-16463
Acidic fibroblast growth factor receptor purified from bovine
liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
##molecule_type protein
##residues 22-30, 'X', 32-38 #label KU2
##note this form was designated brain-derived growth factor A

#accession B37892
##molecule_type protein
##residues 62-76, 'X', 78-86 #label KUO
##note this sequence is an amino-terminal fragment of a form
designated as brain-derived growth factor B

REFERENCE
A61198
Hall, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry,
I.A.
Brain Res. Dev. Brain Res. (1991) 63:13-19
Class 1 heparin binding growth factor promotes the
differentiation but not the survival of ciliary neurones in
vivo.
#cross-references MUID:92164087
#accession A61198
##molecule_type protein
##residues 11-26; 28-50; 53-110, 'H', 112, 'NTY'; 134-155 #label HIL

REFERENCE
I46024
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet,
J.; Courtois, Y.; Edwards, J.B.
Biochem. Biophys. Res. Commun. (1992) 188:843-850
Cloning of two different 5' untranslated exons of bovine
acidic fibroblast growth factor by the single strand
ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
##status translated from GB/EMBL/DBJ
##molecule_type mRNA
##residues 1-18 #label PH2
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
#accession A34477
Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine
heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
##status preliminary
##molecule_type protein
##residues 16-24; 121-127; 134-143 #label SAS
##experimental_source heart
COMMENT
The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT
This protein binds heparin, although less strongly than does bFGF.
There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the pig
...
Note: remainder of annotations omitted.

Query Match 72.5%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 9,636-180;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCNSGGYFLRILPDGTVDGTRSDQHIQLQSAESVGEVIKSTGTQPL 80
:|||||
QY 41 ANYKKPKLLYCNSGGHFLRILPDGTVDGTRSDQHIQLQSAESVGEVIKSTGTQYL 100
:|||||

Db 81 AMDTGLLYGSTPNECLFLERLEENHYNTYISKHAEKHNFGVLKNGRSKLGPRTHF 140
:|||||
QY 101 AMDTGLLYGSTPNECLFLERLEENHYNTYISKHAEKHNFGVLKNGRSKLGPRTHY 160
:|||||

Db 141 GOKAILFLPLPVSSD 155
:|||||
QY 161 GOKAILFLPLPVSSD 175
:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373

REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
##molecule_type protein
##residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
#classification #superfamily fibroblast growth factor
#keywords growth factor

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#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
        bovine uterus: purification and N-terminal amino acid
        sequence.
#cross-references MUID:90121211
#accession A33784
##molecule_type protein
##residues 1-14 ##label MIL
##note demonstration of a possible alternative initiator or
        splice junction
REFERENCE
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterisation and tissue localisation of an
        N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
##molecule_type protein
##residues 16-35 ##label BER
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
        growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
##molecule_type protein
##residues 27-35, 'X', 37-41 ##label UE3
##experimental_source testes
##note This form appears to be identical to the renal form
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
        Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
        factor from bovine liver: structural homology with basic
        fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
##molecule_type protein
##residues 23-35, 'X', 37-42 ##label UEN
##experimental_source liver
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
        fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
        composition matched what was thought to be the signal
        sequence
REFERENCE
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
        Bohlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
        gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
##molecule_type protein
##residues 12-25, 27-35, 'X', 37-40 ##label GOS
##experimental_source adrenal gland
REFERENCE
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
        L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
        R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
        factor (FGF) and comparison with the amino-terminal
        sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386

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##molecule_type protein
##residues 12-157 ##label ESC
##experimental_source pituitary gland
REFERENCE
#authors Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
        growth factor from the bovine kidney: homology with basic
        fibroblast growth factor.
#cross-references MUID:86095426
#accession A60316
##molecule_type protein
##residues 27-35, 'X', 37-43 ##label BAI
##experimental_source kidney
REFERENCE
#authors Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
        fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
##molecule_type protein
##residues 12-26 ##label BOH
##note The acidic and basic fibroblast growth factors are the major
        endothelial-cell growth factors. Both are angiogenic agents in
        vivo and are potent mitogens for a variety of mesoderm-derived
        cell types in vitro (although bFGF is 30-100 times more potent
        than aFGF in stimulating the proliferation of normal diploid
        cells).
COMMENT This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
        binding; mitogen
FEATURE
1-157 #product basic fibroblast growth factor, uterine form
        #status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
        form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
        form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
        form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
        #status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
        #status experimental #label MAT6\
29-33, 118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
        pituitary gamma) (probably acetylated) #status
        experimental
SUMMARY #length 157 #checksum 1115
Query Match 41.4%; Score 524; DB 1; Length 157;
Best Local Similarity 51.0%; Pred. No. 4,91e-89;
Matches 76; Conservative 29; Mismatches 42; Indels 2; Gaps 1;
Db 11 LPALPDEGSGAFPGCHPKDPRKLYCKNGGFLRHPDGRVDGVEKSDPHKLOQAE 70
:|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|:
QY 26 VPSAGARANGTLLDANKPKKLLYCSNGHFLRLPDGTVDGTRDSRDOHQLQLSAES 85
:|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|:
Db 71 RGWSIKGVCANRYLAKMKDGRLLASKCVTDCEFFERLESNNYTYRSKYS--SWYVA 128
:|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|:
QY 86 VGEVIKSTGTQGYLAMDTDGLLYGSQTPNECLFLERLENNHYTYISKRAENWFG 145
:|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|:
Db 129 LKRTQYKLGPKTGPQKAILFLPMSAKS 157
:|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|:
QY 146 LKKGKCKRGPRTHYGQKAILFLPLPVSS 174
:|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|: :|:
RESULT 11
ENTRY #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatotropin

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ORGANISM      #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS    S00185
REFERENCE     #authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
              E.C.; Rubira, M.R.; Burgess, A.W.
#journal      FEBS Lett. (1987) 224:128-132
#title        Primary structure of ovine pituitary basic fibroblast growth
              factor.
#cross-references MUID:88055577
#accession     S00185
#molecule_type protein
#residues      1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       growth factor; heparin binding; mitogen
FEATURE        #region heparin binding #status predicted\
18-22          #region heparin binding #status predicted
107-110        #region heparin binding #status predicted
#length 146 #molecular_weight 16434 #checksum 3560
#MARY

Query Match 40.9%; Score 517; DB 1; Length 146;
Best Local Similarity 50.7%; Pred. No. 1.87e-87;
Matches 75; Conservative 29; Mismatches 42; Indels 2; Gaps 1;

Db 1 PALPEDGSSAPFGCHPKDRLKCKNGGFLRHPDGRVDGVRKSDPHIKLQAEER 60
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 27 PSPAGARANGTLLDANYKPKRLKCKNGGFLRHPDGRVDGVRKSDPHIKLQAE 86
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 61 GVSIKGVCANRYLAMKEDGRLKSKVTCDFEERLESNNYYSRKYV--SWVAL 118
   | | | | | : : : : : : : : : : : : : : : : : : : : : : :
QY 87 GEVIKSTETQYLDMDTGLYGSQTPNECLFLEENHYNTYISKKAENKWEVGL 146
   | : | : | : | : | : | : | : | : | : | : | : | : | : | : | :
Db 119 KRTQYKLGPKTGPCKAILEFLPMSSAKS 146
   | : | : | : | : | : | : | : | : | : | : | : | : | : | : | :
QY 147 KNGSKRGPRTHYQKAILFLPLPVSS 174

RESULT 12
ENTRY   A32398 #type complete
TITLE   basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF: fibroblast growth factor 2; prostatic growth factor;
                prostatin
CONTAINS  basic fibroblast growth factor, 18K form
ORGANISM #formal_name Homo sapiens #common_name man
DATE      31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
ACCESSIONS A32398; A61537; A26642; B32878; S00297; A54316; B54316;
          A32364; A25824; B24243; B24301; S42242; B55784; I52267;
          S46253
REFERENCE A32398
#authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
          J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
          Smith, J.A.; Caput, D.
#journal  Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title    High molecular mass forms of basic fibroblast growth factor
          are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues  1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE A61537
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal  Growth Factors (1991) 4:277-287
#title    Functional characterization of the human basic fibroblast
          growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues  1-114 #label SHI
#note      authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title    Cloning and expression of cDNA encoding human basic
          fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues  56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE A30924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
          J.C.
#journal  Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title    Human basic fibroblast growth factor: nucleotide sequence,
          genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues  56-210 #label ABR
#note      the authors translated the codon GAA for residue 108 as
          Gly
REFERENCE S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
          J.; Gospodarowicz, D.; Fiddes, J.C.
#journal  EMBO J. (1986) 5:2523-2528
#title    Human basic fibroblast growth factor: nucleotide sequence and
          genomic organization.
#cross-references MUID:87053817
#accession S00297
#status    not compared with conceptual translation
#molecule_type DNA
#residues  1-155 #label AB2
#note      the authors translated the codon GAA for residue 108 as
          Gly
REFERENCE A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
          Hirohashi, S.
#journal  Jpn. J. Cancer Res. (1991) 82:1263-1270
#title    Characterization of high-molecular-mass forms of basic
          fibroblast growth factor produced by hepatocellular
          carcinoma cells: possible involvement of basic fibroblast
          growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues  'XX',86-'X',90-91,'X',93-95 #label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note      sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues  'XXX',19,'X',21-29 #label SH2
#note      sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
          L.C.; Barr, P.J.; Baird, A.
#journal  J. Cell Biol. (1989) 109:3105-3114
#title    Differential effects of heparin, fibronectin, and laminin on
          the phosphorylation of basic fibroblast growth factor by
          protein kinase C and the catalytic subunit of protein
          kinase A.
#cross-references MUID:90078343
#accession A33624
#status    preliminary
#molecule_type protein
#residues  57-210 #label FEI
REFERENCE A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
          S.C.; Lawson, R.K.
#journal  Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title    Amino-terminal sequence of a large form of basic fibroblast
          growth factor isolated from human benign prostatic
          hyperplastic tissue.

```



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#cross-references MUID:87156686
#accession A25824
#molecule_type protein
#residues 57-77 #label STO
#experimental_source prostate
REFERENCE
A90122
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession B24243
#molecule_type protein
#residues 65-102, 'X', 104-105 #label GIM
#experimental_source brain
REFERENCE
A91384
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession B24301
#molecule_type protein
#residues 65-88, 'X', 90-98, 'X', 100 #label GAU
REFERENCE
S42242
Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
Biochem. Biophys. Res. Commun. (1987) 144:543-550
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087
REFERENCE
A55784
Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession B55784
#molecule_type protein
#residues 54-71 #label PAN
REFERENCE
I52267
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
Reverse transcription with nested polymerase chain reaction
shows expression of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 95-182 #label RES
#cross-references GB:547380; NID:g256535
#experimental_source granulosa cells
REFERENCE
S46253
Petry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639

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#accession S46253
#molecule_type protein
#residues 39-53; 65-88 #label PAT
#note recombinant gene expressed in Escherichia coli
GENETICS
#gene GDB:FGF2; FGFb
#cross-references GDB:119910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
#alternative initiators; angiogenesis; growth factor; heparin
binding; mitogen
FEATURE
1-210 #product basic fibroblast growth factor, 22.5K form
65-210 #status predicted #label MA2\
#product basic fibroblast growth factor, 18K form
82-86 #status predicted #label MAT\
#region heparin binding #status predicted\
171-174 #region heparin binding #status predicted\
SUMMARY
#length 210 #molecular-weight 22623 #checksum 3610
Query Match 40.9%; Score 517; DB 2; Length 210;
Best Local Similarity 50.3%; Pred. No. 1.87e-87;
Matches 75; Conservative 30; Mismatches 42; Indels 2; Gaps 1;
Db 64 LPALPDGSGAFPPGPKPKRLYCKNGGFLRHPDGRVDGVREKSDPHIKLQQAEE 123
QY 26 VPSAGARANGTLLDANYKKPKLLYCSNGHFLRLPDGTVDGTRDSQHLQLSAES 85
Db 124 RGWSIKGVANRYLAMKEDGRLLKSKCVTDCFFERLESNNYTSRKYT--SWYVA 181
QY 86 VGEVYIKSTGTQYLANDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFG 145
Db 182 LKRTQYKLGSKTGQKQKAILFLPMSAKS 210
QY 146 LKNGSKRGPRTHYGQKAILFLPLPVS 174
RESULT 13
ENTRY A31674 #type complete
TITLE Basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM Rattus norvegicus #common_name Norway rat
DATE 21-May-1990 #sequence_revision 21-May-1990 #text_change
16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE A31674
#authors Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
Cooksey, K.; Baird, A.; Ling, N.
#journal Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of
its mRNA.
#cross-references MUID:89061721
#accession A31674
#molecule_type mRNA
#residues 1-154 #label SHI
#cross-references GB:M22427; NID:g204285; PIDN:AAA1210.1; PID:g204286
REFERENCE S00876
#authors Kurokawa, T.; Seno, M.; Igarashi, K.
#journal Nucleic Acids Res. (1988) 16:5201
#title Nucleotide sequence of rat basic fibroblast growth factor
cDNA.
#cross-references MUID:88262516
#accession S00876
#molecule_type mRNA
#residues 1-154 #label KUR
#cross-references EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204
REFERENCE S24309
#authors El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
#journal Biochim. Biophys. Acta (1992) 1131:314-316
#title PCR detection of the rat brain basic fibroblast growth factor
(bFGF) mRNA containing a unique 3' untranslated region.

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#cross-references MUID:92329546
#accession S24309
##status preliminary; translation not shown
##molecule_type mRNA
##residues 35-154 ##label ELH
##cross-references EMBL:X61697; NID:g56143; PIDN:CAA43863.1; PID:g56144
CLASSIFICATION superfamily fibroblast growth factor
KEYWORDS growth factor
FEATURE
1-9
10-154
SUMMARY
#domain signal sequence #status predicted #label SIG\
#product basic fibroblast growth factor #status
predicted #label MAT
#length 154 #molecular-weight 17139 #checksum 3026

Query Match 40.6%; Score 513; DB 2; Length 154;
Best Local Similarity 52.5%; Pred.No. 1.49e-86;
Matches 74; Conservative 26; Mismatches 39; Indels 2; Gaps 1;

16 GGGAGPPGHFKPRLYCKNGGFFLRTHPDGRVDGVREKSDPHVKQLQAEERGVSIGK 75
: : : : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
34 ANGTLLDANYKKPLLKCYSGNGHFRLPLDPTGTRDRSDQHILQLSAESVGEVIKS 93
: : : : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Db 76 VCANRYLAMKEDEGLLASKCVTECEFFERLESNNYNTYSRKYS--SWYVALKRTGQVK 133
: : : : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 94 TETGOYLAMTDGLGYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVLKKGNSCK 153
: : : : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Db 134 LGSKTGPQKAILFLPMSAKS 154
: : : ||||| ||||| ||| : :
Qy 154 RGPRTYGQKAILFLPLPVSS 174
: : : ||||| ||||| ||| : :

RESULT 14
ENTRY C37360 #type complete
TITLE basic fibroblast growth factor - mouse
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS C37360
REFERENCE A37360
#authors Hebert, J.M.; Basilio, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members an characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession C37360
##status preliminary
##molecule_type mRNA
##residues 1-154 ##label HEB
##cross-references GB:M30644; NID:g193296; PIDN:AAA37621.1; PID:g309239
CLASSIFICATION superfamily fibroblast growth factor
SUMMARY
#length 154 #molecular-weight 17153 #checksum 2906

Query Match 40.2%; Score 508; DB 2; Length 154;
Best Local Similarity 54.5%; Pred.No. 2.00e-85;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPRLKCYCKNGGFFLRTHPDGRVDGVREKSDPHVKQLQAEERGVSIGKVCAARYL 82
: : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 41 ANYKKPLLKCYSGNGHFRLPLDPTGTRDRSDQHILQLSAESVGEVIKSTFGOYL 100
: : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Db 83 AMKEDGRLASKCVTECEFFERLESNNYNTYSRKYS--SWYVALKRTGQYKLGSKTGP 140
: : : ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 101 AMTDTGLGYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVLKKGNSCKRGRPTHY 160
: : : ||||| ||||| ||| : :
Db 141 GQKAILFLPMSAKS 154
: : : ||||| ||||| ||| : :
Qy 161 GQKAILFLPLPVSS 174
: : : ||||| ||||| ||| : :

RESULT 15
ENTRY S31622 #type fragment
```

[M][A][S][I][R][E]

(TM)

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mpsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:41:17 2000; MasPar time 7.28 Seconds
Tabular output not generated. 745.209 Million cell updates/sec

Title: >US-09-121-017B-3
Description: (1-175) from US09121017B.pep
Perfect Score: 1265
Sequence: 1 MSRGAGRVGCTLQALVFLGV.....PRTHYGKAILFLPLPVSSD 175

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: swiss-prot38
1:swissprot

Statistics: Mean 44.360; Variance 69.125; scale 0.642

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				Pred. No.	
Result No.	Score	Query Match	Description	ID	
1	986	77.9	HEPARIN-BINDING GROWTH	2.42e-222	
2	989	76.6	HEPARIN-BINDING GROWTH	8.20e-218	
3	966	76.4	HEPARIN-BINDING GROWTH	5.16e-217	
4	955	75.5	HEPARIN-BINDING GROWTH	4.39e-214	
5	917	72.5	HEPARIN-BINDING GROWTH	5.62e-204	
6	916	72.4	HEPARIN-BINDING GROWTH	1.04e-203	
7	530	41.9	HEPARIN-BINDING GROWTH	1.21e-102	
8	524	41.4	HEPARIN-BINDING GROWTH	4.17e-101	
9	518	40.9	HEPARIN-BINDING GROWTH	1.43e-99	
10	517	40.9	HEPARIN-BINDING GROWTH	2.58e-99	
11	513	40.6	HEPARIN-BINDING GROWTH	2.71e-98	
12	508	40.2	HEPARIN-BINDING GROWTH	5.13e-97	
13	505	39.9	HEPARIN-BINDING GROWTH	2.99e-96	
14	493	39.0	HEPARIN-BINDING GROWTH	3.42e-93	
15	473	37.4	HEPARIN-BINDING GROWTH	4.13e-88	
16	360	28.5	GLIA-ACTIVATING FACTOR	7.36e-60	
17	350	27.7	GLIA-ACTIVATING FACTOR	2.09e-57	
18	350	27.7	GLIA-ACTIVATING FACTOR	2.09e-57	
19	350	27.7	GLIA-ACTIVATING FACTOR	2.09e-57	
20	322	26.2	FIBROBLAST GROWTH FACT	5.12e-53	
21	327	25.8	FIBROBLAST GROWTH FACT	8.37e-52	
22	303	24.0	KERATINOCYTE GROWTH FA	5.10e-46	
23	300	23.7	KERATINOCYTE GROWTH FA	2.66e-45	

ALIGNMENTS				PRT: 155 AA.	
RESULT	1	STANDARD;			
ID	FGF1_HUMAN				
AC	P05230; P07502;				
DT	13-AUG-1987 (Rel. 05, Created)				
DT	13-AUG-1987 (Rel. 05, Last sequence update)				
DT	15-JUL-1999 (Rel. 38, Last annotation update)				
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).				
GN	FGF1 OR FGFA.				
OS	Homo sapiens (Human).				
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;				
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RX	MEDLINE; 86261805.				
RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;				
RT	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.";				
RL	Science 233:541-545(1986).				
RN	[2]				
RP	SEQUENCE FROM N.A.				
RC	TISSUE-BRAIN STEM;				
RX	MEDLINE; 89343957.				
RA	Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;				
RT	"Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.";				
RL	Mol. Cell. Biol. 9:2387-2395(1989).				
RN	[3]				
RP	SEQUENCE FROM N.A.				
RC	TISSUE-BRAIN STEM;				
RX	MEDLINE; 90265618.				
RA	Chiu I.M., Wang W.P., Lehtoma K.;				
RT	"Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.";				
RL	Oncogene 5:755-762(1990).				
RN	[4]				
RP	SEQUENCE FROM N.A.				
RX	MEDLINE; 90073637.				
RA	Mergia A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;				
RT	"Structural analysis of the gene for human acidic fibroblast growth factor.";				
RL	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).				
RN	[5]				
RP	SEQUENCE FROM N.A.				

24	296	23.4	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA	2.41e-44
25	289	22.8	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT	1.12e-42
26	285	22.5	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT	9.96e-42
27	285	22.5	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT	9.96e-42
28	281	22.2	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT	8.82e-41
29	280	22.1	208	1	FGF6_MOUSE	FIBROBLAST GROWTH FACT	1.52e-40
30	278	22.0	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT	4.51e-40
31	276	21.8	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT	1.34e-39
32	274	21.7	247	1	FGFE_MOUSE	FIBROBLAST GROWTH FACT	3.96e-39
33	274	21.7	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT	3.96e-39
34	274	21.7	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT	3.96e-39
35	273	21.6	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT	6.80e-39
36	272	21.5	194	1	FGF7_RAT	KERATINOCYTE GROWTH FA	1.17e-38
37	270	21.3	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT	3.45e-38
38	269	21.3	256	1	FGF3_BRARE	FIBROBLAST GROWTH FACT	5.92e-38
39	269	21.3	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT	5.92e-38
40	263	20.3	225	1	FGFB_HUMAN	FIBROBLAST GROWTH FACT	1.51e-35
41	257	20.3	206	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT	3.77e-35
42	257	20.3	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT	3.77e-35
43	256	20.2	243	1	FGFC_HUMAN	FIBROBLAST GROWTH FACT	6.44e-35
44	252	19.9	220	1	FGF3_CHICK	FIBROBLAST GROWTH FACT	5.46e-34
45	248	19.6	245	1	FGFD_HUMAN	FIBROBLAST GROWTH FACT	4.60e-33

RX MEDLINE; 92019819.
 RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;
 RT "Cloning and sequence analysis of the human acidic fibroblast growth
 factor gene and its preservation in leukemia patients.";
 RL Oncogene 6:1521-1529(1991).
 RN [6]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 92202857.
 RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,
 RT "An acidic fibroblast growth factor protein generated by alternate
 splicing acts like an antagonist.";
 RL J. Exp. Med. 175:1073-1080(1992).
 RN [7]
 RP SEQUENCE OF 1-154 FROM N.A.
 RX MEDLINE; 94069734.
 RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;
 RT "The expression of acidic fibroblast growth factor (heparin-binding
 growth factor-1) and cytokine genes in human cardiac allografts and T
 cells";
 RL Transplantation 56:1177-1182(1993).
 RN [8]
 RP SEQUENCE OF 1-40 FROM N.A.
 RX MEDLINE; 90365758.
 RA Crumley G., Dionne C.A., Jaye M.;
 RT "The gene for human acidic fibroblast growth factor encodes two
 upstream exons alternatively spliced to the first coding exon";
 RL Biochem. Biophys. Res. Commun. 171:7-13(1990).
 RN [9]
 RP SEQUENCE OF 16-155.
 RX MEDLINE; 86296647.
 RA Harper J.W., Strydom D.J., Lobb R.R.;
 RT "Human class I heparin-binding growth factor: structure and homology
 to bovine acidic brain fibroblast growth factor";
 RL Biochemistry 25:4097-4103(1986).
 RN [10]
 RP SEQUENCE OF 16-155.
 RX MEDLINE; 86295741.
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
 RT "The complete amino acid sequence of human brain-derived acidic
 fibroblast growth factor";
 RL Biochem. Biophys. Res. Commun. 138:611-617(1986).
 RN [11]
 RP SEQUENCE OF 16-155.
 RX MEDLINE; 87048871.
 RA Gautschi-Sova P., Mueller T., Boehlen P.;
 RT "Amino acid sequence of human acidic fibroblast growth factor.";
 RL Biochem. Biophys. Res. Commun. 140:874-880(1986).
 RN [12]
 RP SEQUENCE OF 16-47.
 RX MEDLINE; 86186784.
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
 RT "Human brain-derived acidic and basic fibroblast growth factors:
 amino terminal sequences and specific mitogenic activities";
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
 RN [13]
 RP SEQUENCE OF 16-49.
 RX MEDLINE; 86275260.
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;
 RT "Partial molecular characterization of endothelial cell mitogens from
 human brain: acidic and basic fibroblast growth factors.";
 RL FEBS Lett. 204:203-207(1986).
 RN [14]
 RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
 RX MEDLINE; 96194129.
 RA Blaber M., Disalvo J., Thomas K.A.;
 RT "X-ray crystal structure of human acidic fibroblast growth factor.";
 RL Biochemistry 35:2086-2094(1996).
 RN [15]
 RP STRUCTURE BY NMR OF 24-155.
 RX MEDLINE; 94358885.
 RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,
 Gimenez-Gallego G.;
 RT "1H-NMR assignment and solution structure of human acidic fibroblast
 growth factor activated by inositol hexasulfate.";
 RL J. Mol. Biol. 242:81-98(1994).
 RN [16]
 RP STRUCTURE BY NMR OF 24-155.
 RX MEDLINE; 97107535.
 RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
 Rico M., Gimenez-Gallego G.;
 RT "Three-dimensional structure of acidic fibroblast growth factor in
 solution: effects of binding to a heparin functional analog.";
 RL J. Mol. Biol. 264:162-178(1996).
 RN [17]
 RP STRUCTURE BY NMR OF 25-155.
 RX MEDLINE; 98387896.
 RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
 RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
 6-naphthalenesulfonate: a minimal model for the anti-tumoral
 action of suramin and suradistas.";
 RL J. Mol. Biol. 281:899-915(1998).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC -----
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 CC -----
 DR EMBL; M13361; AAA79245.1;
 DR EMBL; X51943; CAA36206.1;
 DR EMBL; X50492; AAA52446.1;
 DR EMBL; M30490; AAA52446.1; JOINED.
 DR EMBL; M30491; AAA52446.1; JOINED.
 DR EMBL; M60515; AAA51672.1;
 DR EMBL; M60516; AAA51673.1;
 DR EMBL; M23087; AAA52638.1;
 DR EMBL; M23086; AAA52638.1; JOINED.
 DR EMBL; S67291; AAB29057.1;
 DR EMBL; X65778; CAA46661.1;
 DR PIR; A23553; A23553.
 DR PIR; A24243; A24243.
 DR PIR; A24301; A24301.
 DR PIR; A24662; A24662.
 DR PIR; A24820; A24820.
 DR PIR; A26386; A26386.
 DR PIR; A33665; A33665.
 DR PIR; S18217; S18217.
 DR PDB; 2AFG; 15-OCT-95.
 DR PDB; 1AXM; 22-APR-98.
 DR PDB; 2AXM; 22-APR-98.
 DR PDB; 1RML; 11-NOV-98.
 DR MIM; 131220;
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; IL1HGF.
 DR PRINTS; PR00263; HGFEGF.
 DR PROSITE; PS00247; HGF_FGF; 1.
 DR PROSITE; PS00247; HGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
 3D-structure.
 FT PROPEP 1 15 HEPARIN-BINDING GROWTH FACTOR 1.
 FT CHAIN 16 155 ACETYLATION
 FT MOD_RES 2 2
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17460 MW; F586E8BFB09F1580 CRC64;

RESULT	3
ID	FGF1_MOUSE
STANDARD;	PRT; 155 AA.
AC	F10935;
DT	01-JUL-1989 (Rel. 11, Created)
DT	01-JUL-1989 (Rel. 11, Last sequence update)
DT	15-JUL-1999 (Rel. 38, Last annotation update)
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE	GROWTH FACTOR) (AFGF).
GN	FGF1 OR FGF-1 OR FGFA.
OS	Mus musculus (Mouse), and Rattus norvegicus (Rat).
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC	Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Mus.
PN	[1]

RC	SPECIES-RAT;
RC	MEDLINE: 89240051.
RX	
RA	Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
RT	"The nucleotide sequence of rat heparin binding factor 1
RT	(HBGF-1)".
RT	(HBGF-1)".
RT	Nucleic Acids Res. 17:2867-2867(1989).
RN	[2]
RC	SEQUENCE FROM N.A.
RP	
RC	SPECIES-MOUSE;
RX	
RA	MEDLINE: 90201563.
RA	Hebert J.M., Basillico C., Goldfarb M., Haub O., Martin G.R.;
RT	"Isolation of cDNAs encoding four mouse FGF family members and
RT	characterization of their expression patterns during embryogenesis.";
RT	Dev. Biol. 138:454-463(1990).
RN	[2]

KN	[3]	SEQUENCE FROM N.A.
RP		SPECIES-MOUSE;
RC		MEDLINE; 97128312.
RX		Madai F., Hackshaw K.V., Chiu I.M.;
RA		"Cloning and characterization of the mouse Fgf-1 gene.";
RT		Gene 179:231-236(1996).
RL	[4]	
RN		SEQUENCE FROM N.A.
RP		SPECIES-MOUSE; STRAIN-BALB/C;
RC		MEDLINE; 97094746.
RX		Alam K.Y., Frostholtm A., Hackshaw K.V., Evans J.E., Rotter A.,
RA		Chiu I.M.;
RT		"Characterization of the 1B promoter of fibroblast growth factor 1
RL		and its expression in the adult and developing mouse brain.";

J. Biol. Chem. 271:30263-30271(1996).

-!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.

-!- SUBUNIT: MONOMER.

-!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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DR EMBL; X14232; CRA32448.1; -
DR EMBL; M30641; AAA37618.1; -
DR EMBL; U36459; AAC52969.1; -
DR EMBL; U36457; AAC52969.1; JOINED.
DR EMBL; U36458; AAC52969.1; JOINED.
DR EMBL; U67610; AAC52907.1; -
DR PIR; S04147; SC4147.
DR PIR; D37360; D37360.
DR HSSP; P05230; 2AXM.
DR MGD; MGI:95515; FGFL.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HRGF

```

DR PRINTS; PR00263; HBGFPGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 15
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;

Query Match 76.4%; Score 966; DB 1; Length 155;
 Best Local Similarity 96.3%; Pred. No. 5.16e-217;
 Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNVKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESAGEVYIKGTGGVYL 80
 :|||||
 QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTETGQL 100
 :|||||

Db 81 AMDTGLLYGSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPRTHY 140
 :|||||
 101 AMDTGLLYGSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPRTHY 160
 :|||||

141 GKAILFLPLPVSSD 155
 :|||||
 QY 161 GKAILFLPLPVSSD 175
 :|||||

RESULT 4
 ID FGF1_PIG STANDARD; PRT; 152 AA.
 AC P2002;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR
 DE (FRAGMENT)).
 GN FGF1 OR FGF-1.
 OS Sus scrofa (Pig).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Suidae; Sus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE=HEART;
 RX MEDLINE; 92062117.
 RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;
 RT "Amplification and sequencing of mRNA encoding acidic fibroblast
 RT growth factor (afgf) from porcine heart";
 RL Biochem. Biophys. Res. Commun. 180:853-859(1991).
 RN [2]
 CC SEQUENCE OF 22-41.
 CC MEDLINE; 89231704.
 CC Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,
 RA Sharma H.S., Schaper W.;
 RT "Isolation of heparin-binding growth factors from bovine, porcine and
 RT canine hearts";
 RL Eur. J. Biochem. 181:67-73(1989).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
 CC THAN DOES BFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 CC EMBL; X60317; CAA42869.1; -

DR PIR; S03954; S03954.
 DR HSP; P05230; 2AXM.
 DR PFAM; PF00167; EGF; 1.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 15
 FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.
 FT BINDING 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
 FT BINDING 24 28 HEPARIN (POTENTIAL).
 FT BINDING 113 116 HEPARIN (POTENTIAL).
 FT CONFLICT 31 31 C -> S (IN REF. 2).
 FT CONFLICT 39 39 R -> Y (IN REF. 2).
 FT NON_TER 152
 SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 75.5%; Score 955; DB 1; Length 152;
 Best Local Similarity 95.6%; Pred. No. 4.39e-214;
 Matches 129; Conservative 2; Mismatches 4; Indels 0; Gaps 0;

Db 18 LPPGVKKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTETG 77
 :|||||
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTETG 97
 :|||||

Db 78 QYLAMDTGLLYGSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPR 137
 :|||||
 QY 98 QYLAMDTGLLYGSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPR 157
 :|||||

Db 138 THYGOKAILFLPLPV 152
 :|||||
 QY 158 THYGOKAILFLPLPV 172
 :|||||

RESULT 5
 ID FGF1_BOVIN STANDARD; PRT; 155 AA.
 AC P03968;
 DT 23-OCT-1986 (Rel. 02, Created)
 DT 01-MAR-1989 (Rel. 10, Last sequence update)
 DT 15-JUL-1999 (Rel. 38, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
 DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR
 DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF
 DE II).
 GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
 OS Bos taurus (Bovine).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
 OC Bovidae; Bovinae; Bos.
 RN [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE=RETINA;
 RX MEDLINE; 89083506.
 RA Halley C., Courtois Y., Laurent M.;
 RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.";
 RL Nucleic Acids Res. 16:10913-10913(1988).
 RN [2]
 RP SEQUENCE FROM N.A.
 RC TISSUE=RETINA;
 RX MEDLINE; 89078619.
 RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
 RT "Characterization of a bovine acidic FGF cDNA clone and its
 RT expression in brain and retina";
 RL FEBS Lett. 242:41-46(1988).
 RN [3]
 RP SEQUENCE OF 2-155.
 RX MEDLINE; 87016918.
 RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
 RT "Structural evidence that endothelial cell growth factor beta is the
 RT precursor of both endothelial cell growth factor alpha and acidic
 RT fibroblast growth factor";
 RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
 RN [4]
 RP SEQUENCE OF 2-155.
 RX MEDLINE; 87026586.

AC P03969;
 DT 23-OCT-1986 (Rel. 02, Created)
 DT 23-OCT-1986 (Rel. 02, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BEGF) (PROSTATROPIN) [CONTAINS: KIDNEY-DERIVED GROWTH
 DE FACTOR].
 GN FGF2 OR FGF-2.
 OS Bos taurus (Bovine).
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
 OC Bovidae; Bovinae; Bos.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 86261806.
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Fiddes J.C.,
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,
 RA Hjerild K.A., Gospodarowicz D., Fiddes J.C.;
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic
 RT protein, basic fibroblast growth factor.";
 RT Science 233:545-548(1986).
 RP [2]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 87217066.
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
 RA "Human basic fibroblast growth factor: nucleotide sequence, genomic
 RT organization, and expression in mammalian cells.";
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
 RN [3]
 RP SEQUENCE OF 10-155.
 RX MEDLINE; 86016731.
 RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,
 RA Gospodarowicz D., Boehlen P., Guillemin R.;
 RT "Primary structure of bovine pituitary basic fibroblast growth factor
 RT (FGF) and comparison with the amino-terminal sequence of bovine brain
 RT acidic FGF.";
 RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).
 RN [4]
 RP SEQUENCE OF 1-99.
 RX MEDLINE; 86295737.
 RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;
 RT "Isolation of an amino terminal extended form of basic fibroblast
 RT growth factor.";
 RL Biochem. Biophys. Res. Commun. 138:580-588(1986).
 RN [5]
 RP SEQUENCE OF 25-41.
 RX MEDLINE; 86095426.
 RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;
 RT "Isolation and partial characterization of an endothelial cell growth
 RT factor from the bovine kidney: homology with basic fibroblast growth
 RT factor.";
 RL Regul. Pept. 12:201-213(1985).
 RN [6]
 RP SEQUENCE OF 21-40.
 RX MEDLINE; 87119165.
 RA Ueno N., Baird A., Esch F., Shimazaki S., Ling N., Guillemin R.;
 RT "Purification and partial characterization of a mitogenic factor from
 RT bovine liver: structural homology with basic fibroblast growth
 RT factor.";
 RL Regul. Pept. 16:135-145(1986).
 RN [7]
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).
 RX MEDLINE; 91095983.
 RA Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,
 RA Hsu B.T., Rees D.C.;
 RT "Three-dimensional structures of acidic and basic fibroblast growth
 RT factors.";
 RL Science 251:90-93(1991).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.

CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
 CC -----
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 CC -----
 CC EMBL; M13440; AAA30518.1;
 DR PIR; A24663; GKBOB.
 DR PIR; A24819; A24819.
 DR PIR; A32878; A32878.
 DR PDB; 1BAS; 31-OCT-93.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILJHBGF.
 DR PRINTS; PR00263; HBGFEGF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding;
 FT 3D-structure.
 FT PROPEP 1 9
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.
 FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
 FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
 FT BINDING 116 119 HEPARIN (POTENTIAL).
 FT STRAND 30 34 HEPARIN (POTENTIAL).
 FT TURN 35 38
 FT STRAND 39 43
 FT TURN 45 46
 FT STRAND 55 56
 FT TURN 58 60
 FT HELIX 62 68
 FT STRAND 69 70
 FT TURN 71 76
 FT STRAND 81 85
 FT TURN 87 88
 FT TURN 91 94
 FT STRAND 99 101
 FT STRAND 103 107
 FT TURN 109 110
 FT STRAND 113 117
 FT TURN 121 122
 FT STRAND 124 124
 FT STRAND 127 127
 FT TURN 129 130
 FT STRAND 133 133
 FT STRAND 136 138
 FT TURN 141 142
 FT TURN 144 146
 FT STRAND 148 151
 SQ SEQUENCE 155 AA; 17250 MW; BBCE70FA6107129 CRC64;
 Query Match 41.4%; Score 524; DB 1; Length 155;
 Best Local Similarity 51.0%; Pred. No. 4.17e-101;
 Matches 76; Conservative 29; Mismatches 42; Indels 2; Gaps 1;
 DB 9 LPALPDGSGAPPGFHKPKRKYCKNGGFFLRHPDGRVDGVREKSDPFIKLQLAEE 68
 QY 26 VPSAGARANGTLLDANKPKLLYCSNGGFFLRILPDGTVDGTRDSQHIQLQLSAES 85
 DB 69 RGWVSIKVCANRYLAMKEDGRLLASKVCVTECFERLESNNYTYRSKYS--SWYVA 126
 QY 86 VGEVYIKSTGTQYLAAMDTDGLLYGSQTPNEECLEFLERLEENHYNTYISKHAENWFG 145
 DB 127 LKRTQYKLGPKTGPQKAILFLPMSAKS 155


```

RESULT 11
FGF2,RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
[1]
SEQUENCE FROM N.A.
STRAIN:SPRAGUE-DAWLEY; TISSUE-OVARY;
MEDLINE: 89061721.
RA Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
COoksey K., Baird A., Ling N.;
"Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of its mRNA.";
Biochem. Biophys. Res. Commun. 157:256-263(1988).
[2]
SEQUENCE FROM N.A.
STRAIN:SPRAGUE-DAWLEY; TISSUE-TESTIS;
MEDLINE: 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
"Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
Nucleic Acids Res. 16:5201-5201(1988).
[3]
SEQUENCE OF 1-28 FROM N.A.
STRAIN:SPRAGUE-DAWLEY; TISSUE-TESTIS;
MEDLINE: 97200905.
RA Pasunurathi K.B.S., Jin Y., Cattini P.A.;
"Cloning of the rat fibroblast growth factor-2 promoter region and
its response to mitogenic stimuli in glioma C6 cells.";
J. Neurochem. 68:898-908(1997).
[4]
SEQUENCE OF 35-154 FROM N.A.
STRAIN:SPRAGUE-DAWLEY; TISSUE-BRAIN;
MEDLINE: 93239546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
"PCR detection of the rat brain basic fibroblast growth factor (BFGF)
mRNA containing a unique 3' untranslated region.";
Biochim. Biophys. Acta 1131:314-316(1992).
-!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CONCENTRATION OF THESE 2 GROWTH FACTORS.
-!- SUBUNIT: MONOMER.
-!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
-!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
-!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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EMBL: M22427; AAA41210.1; -
EMBL: X07285; CAA30265.1; -
EMBL: U78079; AAC53225.1; -
EMBL: X61697; CAA43863.1; -
PIR: S00876; S00876.
PIR: A31674; A31674.
HSP: P09038; IBF.
PFAM: PF00167; FGF; 1.
PRINTS: PR00262; IL1HBGF.

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Query Match 39.9%; Score 505; DB 1; Length 156;
Best Local Similarity 49.4%; Pred. No. 2.99e-96;

Search completed: Tue Aug 29 15:41:43 2000
Job time : 26 secs..

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RESULT      15
ID          FGFP2_RABIT        STANDARD;             PRN       137 AA.
AC          P48799;
DT          DT
01-FEB-1996 (Rel. 33, Created)
DT          DT
01-FEB-1996 (Rel. 33, Last sequence update)
DT          DT
01-FEB-1996 (Rel. 33, Last annotation update)
DT          DT
HEPARIN-BINDING GROWTH FACTOR 2 (HBGF-2) (BASIC FIBROBLAST GROWTH
FACTOR) (BFGF) (PROSTATROPIN) (FRAGMENT).
OS          GN
OC          Oryctolagus cuniculus (Rabbit).
OC          Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC          Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctologus.
[1]
SEQUENCE FROM N.A.
STRAIN=NEW ZEALAND WHITE; TISSUE=SMOOTH MUSCLE;
WINKLE; 93343209.
RA          Medline J.A., Friesel R., Alberts G.F., Janat M.F.; Liao G.;
RT "Elevated expression of basic fibroblast growth factor in an
RT immortalized rabbit smooth muscle cell line.";
RL Am. J. Pathol. 143:518-527(1993).
CC -! FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -! SUBUNIT: MONOMER.
CC -! MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGE.
CC -! SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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EMBL; LJ2034; AAA31248.1; -.
DR         HSSP; P09038; 1BFf.
DR         PFAM; PF00167; FGF; 1.
DR         PROSITE; PS00247; HBGF_FGF_1.
KW Growth factor; Mitogen; Vasculization; Heparin-binding.
FT BINDING           18     22    HEPARIN (POTENTIAL).
FT   BINDING         107    110    HEPARIN (POTENTIAL).
FT NON_TER          137    137
SQ SEQUENCE 137 AA; 15418 MW;  OD9EE457B88EC51 CRC64;
Query Match            37 48; Score 473; DB 1; Length 137;
Best Local Similarity 50.48; Pred.No. 4.13e-88;
Matches              70; Conservative 27; Mismatches 40; Indels 2; Gaps 1;

Db      1 PALPDGSGAFPPGHFKDPKRYCKNGGGFLRHDPGRVDGVREKSDDPHIKQLQAEER 60
QY      : :::: :::: | | | | | | | | | | | | | | | | | | | | | |
27 PSPAGARANGLTDANYKKPKLYCSNGHGHLRLIPDGTVDGTRDSQHIIQLSAESV 86
DB      61 GVYSIGVCANRYLAMKEDGRLLAKSCVTDCFFERLESNNNTTNRKYIS--SYVAL 118
QY      | ||| : ::|| | | | | | | | | | | | | | | | | | | | | | |
87 GEYYIKSTEGFOAWMDTGDLGYLSQTNPNECLFLERLEENHYNTISKHAEKNWFVL 146
DB      119 KRTGOVKLGSKTPGGOKAI 137
```

(TM)

Result No.	Query		Length	DB	ID	Description	Pred. No.
	Score	Match					
1	517	40.9	196	4	P78443	21 KD BASIC FIBROBLAST	2.77e-95
2	511	40.4	130	6	O77757	BASIC FIBROBLAST GROWT	8.18e-94
3	382	30.2	101	13	P79706	BASIC FGF (FRAGMENT)	1.23e-62
4	346	27.4	146	13	Q07659	FIBROBLAST GROWTH FACT	3.96e-54
5	313	24.7	115	11	Q60487	BASIC FIBROBLAST GROWT	1.95e-46
6	306	24.2	212	13	O42407	FIBROBLAST GROWTH FACT	8.09e-45
7	302	23.9	194	6	P79150	KERATINOCYTE GROWTH FA	6.75e-44
8	274	21.7	252	11	O89096	FHF-4B.	1.67e-37
9	267	21.1	60	4	Q16588	ACIDIC FIBROBLAST GROW	6.38e-36
10	266	21.0	59	4	Q16089	ACIDIC FIBROBLAST GROW	1.07e-35
11	264	20.9	70	11	O54837	FIBROBLAST GROWTH FACT	3.02e-35
12	260	20.6	196	13	Q5VH31	PUTATIVE FIBROBLAST GR	2.39e-34
13	257	20.3	243	13	Q3W6A1	FIBROBLAST GROWTH FACT	1.13e-33
14	251	19.8	127	4	Q9V517	FIBROBLAST GROWTH FACT	2.46e-32
15	250	19.8	206	13	Q3V9D8	FIBROBLAST GROWTH FACT	4.11e-32
16	248	19.6	192	4	O95830	FIBROBLAST GROWTH FACT	1.15e-31
17	248	19.6	245	13	Q3W6A2	FIBROBLAST GROWTH FACT	1.15e-31
18	236	18.7	200	13	P79925	FIBROBLAST GROWTH FACT	5.17e-29
19	226	17.9	425	5	O76831	LET-756 PROTEIN.	8.02e-27
20	225	17.8	74	6	O77561	KERATINOCYTE GROWTH FA	1.32e-26

QY 26 VPSAGARANGTLLDANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDOHJOLLSAES 85

Db 110 RGVVSIKGVCANRYLAMKEDGRLLASCVTCEFFERLESNNYTYRSKVT--SWYVA 167
 QY 86 VGEVYNKSTGTGYLAMDTDGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFG 145

Db 168 LKRTQYKLGSKTGPQOKAILFLPMSAKS 196
 QY 146 LKNGSKRGPRTHYGOKAILFLPLPVSS 174

RESULT 2
 ID Q7767 PRELIMINARY; PRT; 130 AA.
 AC Q7767;
 DT 01-NOV-1998 (TREMBlrel. 08, Created)
 DT 01-NOV-1998 (TREMBlrel. 08, Last sequence update)
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 GN BFGF.

OS Canis familiaris (Dog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
 OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
 [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE=ADRENAL GLAND;
 RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;
 RT "The role of bFGF in canine Hemangiosarcoma";
 RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.
 DR EMBL; AF060562; AAC35912.1;
 DR HSSP; P09038; 1BFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 FT NON_TER 1 130
 FT NON_TER 130 130
 SQ SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;

Query Match 40.4%; Score 511; DB 6; Length 130;
 Best Local Similarity 55.3%; Pred. No. 8.18e-94;
 Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;

Db 1 FKDPKRLKXNGGFFLRHPDGRVDGVREKSDPHVKLOQAERGVSIGVCANRYLAM 60
 QY 43 YKPKLLYCSNGGHEFLRILPDGTVDTRSDQHIQLQLSAESVGEVYIKSTGTGYLAM 102

Db 61 KEDGRLLASCVTCEFFERLESNNYTYRSKYS--SWYVALKRTGYKLGPKTGPQ 118
 QY 103 DTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFGVGLKNGSKRGPRTHYQ 162

Db 119 KAILFLPMSAKS 130
 QY 163 KAILFLPLPVSS 174

RESULT 3
 ID P79706 PRELIMINARY; PRT; 101 AA.
 AC P79706;
 DT 01-MAY-1997 (TREMBlrel. 03, Created)
 DT 01-MAY-1997 (TREMBlrel. 03, Last sequence update)
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
 DE BASIC FGF (FRAGMENT).

OS Cynops pyrrhogaster (Japanese common newt).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
 OC Batrachia; Caudata; Salamandridae; Salamandridae; Cynops.
 [1]
 RP SEQUENCE FROM N.A.
 RC TISSUE=EMBRYO;
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
 RA KANEDA T.;
 RT "Serial expression of the genes in a mesodermatizing ectoderms of
 early Cynops gastrula";
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.
 DR EMBL; D89443; BAAL3958.1;
 DR HSSP; P09038; 2BFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.

DR PFAM; PF00167; FGF; 1.
 FT NON_TER 1 101
 FT NON_TER 101 101
 SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;
 Query Match 30.2%; Score 382; DB 13; Length 101;
 Best Local Similarity 53.4%; Pred. No. 1.23e-62;
 Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;

Db 1 PKRLCKNGGFFLRINSQKVDGAREKSDSYIKLOQAERGVSIGVCANRYLAMKDD 60
 QY 46 PKLLYCSNGGHEFLRILPDGTVDTRSDQHIQLQLSAESVGEVYIKSTGTGYLAMTD 105

Db 61 GRMLKALKWTTDECFERLESNNYTYRSKYSD--WYVALKR 101
 QY 106 GLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFGVGLKK 148

RESULT 4
 ID Q07659 PRELIMINARY; PRT; 146 AA.
 AC Q07659;
 DT 01-NOV-1996 (TREMBlrel. 01, Created)
 DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
 DE FIBROBLAST GROWTH FACTOR.
 GN BFGF.
 OS Gallus gallus (Chicken).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
 [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 93246053.
 RA BORJA A.Z., ZELLER R., MEIJERS C.;
 RT "Expression of alternatively spliced bFGF first coding exons and
 RT antisense mRNAs during chicken embryogenesis";
 RL Dev. Biol. 157:110-118(1993).
 RN [2]

RP SEQUENCE OF 52-85 FROM N.A.
 RX MEDLINE; 90382254.
 RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;
 RT "Fibroblast growth factor during mesoderm induction in the early chick
 RT embryo";
 RL Development 109:387-393(1990).
 DR EMBL; M95706; AAA48616.1;
 DR EMBL; X56804; CAA40139.1;
 DR HSSP; P09038; 2BFF.
 DR PROSITE; PS00247; HBGF_FGF; 1.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILJHBGF.
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 27.4%; Score 346; DB 13; Length 146;
 Best Local Similarity 48.1%; Pred. No. 3.96e-54;
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERVSAMVKLOQAERGVSIGVSNRELAMKEDGRLLALCAATECFERLESNNYN 104
 QY 71 DRSDQHIQLQLSAESVGEVYIKSTGTGYLAMTDGLYGSQTPNEECFLERLEENHYN 130

Db 105 TYRSRKYSD--WYVALKRTGYKPGPKTGPQKAILFLPMSAKS 146
 QY 131 TYISKHAEKNWFGVGLKNGSKRGPRTHYGOKAILFLPLPVSS 174

RESULT 5
 ID Q60487 PRELIMINARY; PRT; 115 AA.
 AC Q60487;
 DT 01-NOV-1996 (TREMBlrel. 01, Created)
 DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
 OS Cavia porcellus (Guinea pig).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

RESULT	7		
ID	P79150	PRELIMINARY;	PRT; 194 AA.
AC	P79150;		
DT	01-MAY-1997	(T=EMBLrel. 03, Created)	
DT	01-MAY-1997	(T=EMBLrel. 03, Last sequence update)	

[illegible]

QY 109 YGQTPNEECFLERLEENHYNTYISK--KHAE--KNWFGVGLKNGSKCRGPRTHYGQKA 164
DB 199 AHFLPKPL 206
QY 165 ILFLPLPV 172
||| I;
RESULT 9
ID Q16588 PRELIMINARY; PRT; 60 AA.
AC Q16588;
DT 01-NOV-1996 (TREMBlrel. 01, Created)
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RA MEDLINE; 94069734.
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
"The expression of acidic fibroblast growth factor (heparin-binding
growth_factor-1) and cytokine genes in human cardiac allografts and T
cells";
RL Transplantation 56:1177-1182(1993).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 92202857.
RA LI Y.L., KIA H., GOLDEN J.A., MIGCHIELSEN A.A.J., GOETZL E.J.,
TURCK E.J.;
"An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist";
RL J. Exp. Med. 175:1073-1080(1992).
DR EMBL; S67292; AAB29058.1;
DR EMBL; X65779; CAA46682.1;
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 60
SQ SEQUENCE 60 AA; 6597 MW; 6CCC7DFF CRC32;
Query Match 21.1%; Score 267; DB 4; Length 60;
Best Local Similarity 87.8%; Pred. No. 6.38e-36;
Matches 36; Conservative 2; Mismatches 3; Indels 0; Gaps 0;
DB 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQHTD 58
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQHIQ 78
||| I;
RESULT 10
ID Q16089 PRELIMINARY; PRT; 59 AA.
AC Q16089;
DT 01-NOV-1996 (TREMBlrel. 01, Created)
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RA MEDLINE; 94069734.
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
"The expression of acidic fibroblast growth factor (heparin-binding
growth_factor-1) and cytokine genes in human cardiac allografts and T
cells";
RL Transplantation 56:1177-1182(1993).
DR EMBL; S67294; AAB29059.1;
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 59
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 21.0%; Score 266; DB 4; Length 59;
Best Local Similarity 92.3%; Pred. No. 1.07e-35;
Matches 36; Conservative 1; Mismatches 2; Indels 0; Gaps 0;
DB 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQH 56
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQH 76
||| I;
RESULT 11
ID 054837 PRELIMINARY; PRT; 70 AA.
AC 054837;
DT 01-JUN-1998 (TREMBlrel. 06, Created)
DT 01-JUN-1998 (TREMBlrel. 06, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RA STRAIN-C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF012926; AAB94020.1;
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 70
SQ SEQUENCE 70 AA; 7677 MW; 15A1BESE CRC32;
Query Match 20.9%; Score 264; DB 11; Length 70;
Best Local Similarity 97.2%; Pred. No. 3.02e-35;
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
DB 35 GNYKKPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQH 70
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQH 76
||| I;
RESULT 12
ID Q9YH31 PRELIMINARY; PRT; 196 AA.
AC Q9YH31;
DT 01-MAY-1999 (TREMBlrel. 10, Created)
DT 01-MAY-1999 (TREMBlrel. 10, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.
OS Notophthalmus viridescens (Eastern newt) (Triturus viridescens).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.
RN [1]
RP SEQUENCE FROM N.A.
RA WEI Y.;
RA "Putative Newt Fibroblast Growth Factor-4";
RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; U76988; AAC98812.1;
DR HSSP; P09038; 1BFF.
DR PROSITE; PS00247; HSGF_FGF; 1.
SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;
Query Match 20.6%; Score 260; DB 13; Length 196;
Best Local Similarity 34.6%; Pred. No. 2.39e-34;
Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;
DB 71 KRLRLYCVNGVIGFHLQVLPDGRHGMHSES-RYSLLEISPVGVGVQSGGLFLAM 129
QY 44 KPKLLYCSNGGHFLRLPDGTGVDGTRDRSDQHIQ 102
||| I;
DB 130 NSKGRFLGSKYFSDCKEKMLLPNYNAYESWRYPGM--YIALSKNGRAKGNKVSPTM 187
QY 103 DTDGLLYGSQTPNEECFLERLEENHYNTYISKHAENWFGVGLKNGSKCRGPRTHYGQ 162
DB 188 TVTHFLP 194
|||

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QY   49 LYCSNGGHFRLRILPDGTVGDRSDQHQLQLLSAESVGSEVVIKSTETQGYLAMDTDGLL 108
Db    61 YSSDVFTPECKFKESVFENYYVVYSTLYRQOESGRAWFLGLNKEQIMKGNRVKTKPS 120
      I::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I
QY   109 YGSOTPNEECLFLERLEENHYNIYSK--KHAE--KNWFVLKKNGSCKRGPRTHYGOKA 164
Db    121 SHFVKPK 127
      I::I
QY   165 ILFLPLP 171
      I::I

RESULT 15
ID QYGD8 PRELIMINARY; PRT; 206 AA.
AC QYGD8;
DT 01-MAY-1999 (T=EMBLrel. 10, Created)
DT 01-MAY-1999 (T=EMBLrel. 10, Last sequence update)
DT 01-NOV-1999 (T=EMBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 6-RELATED PROTEIN.
FGF6.
GN Oncorhynchus mykiss (Rainbow trout) (Salmo gairdneri).
OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Actinopterygii;
OC Neopterygii; Teleostei; Euteleostei; Protacanthopterygii;
OC Salmoniformes; Salmonidae; Oncorhynchus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 99096461.
RA RESCAN P.Y.;
RT "Identification of a fibroblast growth factor 6 (FGF6) gene in a non-mammalian vertebrate: continuous expression of FGF6 accompanies muscle fiber hyperplasia."
RL Blochim. Biophys. Acta 1443:305-314(1998).
DR EMBL; Y16850; CAA76422.1; -.
DR HSP; P09038; IBFF.
DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 206 AA; 23375 MW; 818267C3 CRC32;

Query Match 19.8%; Score 250; DB 13; Length 206;
Best Local Similarity 31.5%; Pred.No. 4.11e-32;
Matches 40; Conservative 36; Mismatches 47; Indels 4; Gaps

Db    81 KVRRLCYCNAGIGFHQLVPDGRINGVHN-ENQYSILEISTVERGVSYLVGRSELFVAM 139
      I::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I
QY   44 KPPELLYSGNGHF-LRLLPDGTVGDRSDQHQLQLLSAESVGSEVVIKSTETQGYLAM 102
      I::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I
Db    140 NSGRGLYGVTFHDECKKFRESMLPNYNAYESVY--RCSYALNKHGRLKGKKTATAM 197
      ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I ::I
QY   103 DTDLGLYGSOTPNEECFLFLERLEENHYNTIYSKKHAENWFLKNGKSCKRGPRTHYGO 162
      I::I
Db    198 TVTHFLP 204
      III
QY   163 KAILFLP 169

```

Search completed: Tue Aug 29 15:43:21 2000
Job time : 80 secs.

WORLD

(TM)

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msrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:48:28 2000; MasPar time 6.87 Seconds
Regular output not generated. 624.017 Million cell updates/sec

Title: >US-09-121-017B-5
Description: (1-181) from US09121017B.pep
Perfect Score: 1300
Sequence: 1 MSRGAGRVQGTQALVELGV.....PRTHYGOKAILFLPLPVSSD 181

Scoring table: PAM 150
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0\$
Listing first 45 summaries

Database: a-geneseq36
1:geneseqp

Statistics: Mean 31.461; Variance 128.544; scale 0.245

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.
1	920	70.8	140	1 R25914	Human acidic fibroblas	6.60e-81
2	920	70.8	140	1 R34497	Human acidic fibroblas	6.60e-81
3	920	70.8	140	1 P90068	Human acid fibroblast	6.60e-81
4	920	70.8	140	1 R74647	Human recombinant aFGF	6.60e-81
5	920	70.8	140	1 W04806	Human acidic fibroblas	6.60e-81
6	920	70.8	140	1 P70995	Sequence of human prot	6.60e-81
7	920	70.8	141	1 R10527	Human acidic fibroblas	6.60e-81
8	920	70.8	151	1 R05789	Human aFGF encoded by	6.60e-81
9	920	70.8	154	1 W92283	Human beta-endothelial	6.60e-81
10	920	70.8	154	1 W06816	Human beta-endothelial	6.60e-81
11	920	70.8	154	1 W06816	Human beta-endothelial	6.60e-81
12	920	70.8	154	1 W75414	Human beta-endothelial	6.60e-81
13	920	70.8	155	1 P94037	Human acidic fibroblas	6.60e-81
14	920	70.8	155	1 R0812	FGF-1.	6.60e-81
15	920	70.8	155	1 P70482	Sequence encoded by co	6.60e-81
16	920	70.8	155	1 R80776	Fibroblast growth fact	6.60e-81
17	920	70.8	155	1 W53022	Fibroblast growth fact	6.60e-81
18	920	70.8	155	1 W75411	Fibroblast growth fact	6.60e-81
19	920	70.8	155	1 W75415	Human endothelial cell	6.60e-81
20	920	70.8	155	1 W92291	Human endothelial cell	6.60e-81
21	920	70.8	165	1 W05785	Human bECGF encoded by	6.60e-81
22	920	70.8	168	1 W06818	Human endothelial cell	6.60e-81
23	917	70.5	134	1 W75413	Human alpha-endothelia	1.35e-80

ALIGNMENTS

RESULT 1

ID	R25914	standard; peptide; 140 AA.
AC	R25914;	
DT	26-JAN-1993	(first entry)
DE	Human acidic fibroblast growth factor.	
KW	herpes varicella; herpes zoster; cytomegalovirus; influenza;	
KW	human respiratory syncytial virus; Semliki Forest virus; HIV;	
KW	human immunodeficiency virus; Moloney Sarcoma virus.	
OS	Homo sapiens.	
PN	EP-497341-A.	
PD	05-AUG-1992.	
PF	30-JAN-1992; 101541.	
PR	31-JAN-1991; GB-002145.	
PR	09-JAN-1992; GB-000410.	
PA	(FARM) FARMITALIA ERBA SRL CARLO.	
PI	Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;	
DR	WPI; 92-260792/32.	
PT	Synergistic antiviral composition contains BFGE and sulphatad	
PT	polysaccharide - for treating viral infections e.g. HSV-1 and -2,	
PT	cytomegalovirus, HIV, influenza virus etc.	
PS	Disclosure; Page 4; 20pp; English.	
CC	This sequence represents acidic fibroblast growth factor (aFGF).	
CC	aFGF, or its fragments may be used in a synergistic compn. with an	
CC	antivirally active sulphated polysaccharide, and one or more	
CC	excipients. The compsn. may be used to control herpes simplex virus	
CC	(HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;	
CC	human respiratory syncytial virus; Semliki Forest virus; HIV or	
CC	Moloney Sarcoma virus. The combination of aFGF with sulphated	
CC	polysaccharide is found to have a greater antiviral activity than	
CC	expected for an additive effect. See also R25913-5.	
SQ	Sequence 140 AA;	

Query Match 70.8%; Score 920; DB 1; Length 140;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db	3	LPPGNYKPKLLYCSNGHFLRLPDGVTGTRDRSDQHILQLSAEVGEVYIKSTETG	62
Qy	38	LLDANYKKPKLLYCSNGHFLRLPDGVTGTRDRSDQHILQLSAEVGEVYIKSTETG	97
Db	63	QYLANDTGILYGSOTPNNECLFLERLEE-----NHYTYISKKHAENKFNVLGKNGS	116
Qy	98	QYLANDTGILYGSOTPNNECLFLERLEEATPAPNHYTYISKKHAENKFNVLGKNGS	157
Db	117	CKRGPRTHYGOKAILFLPLPVSSD	140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

RESULT

ID R34497; standard; protein; 140 AA.

AC R34497;

DE 06-AUG-1993 (first entry)

DE Human acidic Fibroblast Growth Factor.

KW aFGF; mutin; glycosylation site; glycoprotein.

OS Homo sapiens.

PN J05076336-A.

PD 30-MAR-1993.

PF 30-MAY-1991; 127435.

PR 31-MAY-1990; JP-143388.

PA (TAKE) TAKEDA CHEM IND LTD.

DR WPI; 93-139564/17.

PT FGF mutin prep. useful for therapy of burn or thrombosis - by

PT transformation of lymphocyte-contained animal cell by vector

PT contg. DNA encoding FGF mutin

PT Disclosure; Page 3; 23pp; Japanese.

PT The invention covers mutins of FGF (esp. bFGF) which contain at

CC least one glycosylation site. The mutins can be used to treat burns

CC and thrombosis.

SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;

Best Local Similarity 93.8%; Pred. No. 6.60e-81;

Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPFGNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSGTNPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKNGS 116

QY 98 QYLANDTDGLLYGSGTNPNEECFLERLEEAPAPNHYNTYISKHAEKNWFVGLKNGS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

RESULT

ID P90068 standard; protein; 140 AA.

AC P90068;

DE 1-NOV-1989 (first entry)

DE Human acidic fibroblast growth factor

DE Homo sapiens

EP-319052-A.

14-JUN-1989.

PF 14-OCT-1988; 202306.

PR 22-OCT-1987; EP-244431.

PA (MERI) Merck and Co.

PI Thomas Jnr KA, Linemeyer DL;

DR WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor

PT - used for promoting repair of soft tissue, musculoskeletal

PT tissue or vascular or nerve tissue and plasminogen

PT activator prodn.

PS Disclosure; page 4; 36pp; English.

CC Amino acid sequence of human acidic fibroblast growth

CC factor (aFGF). The patent claims mutant forms which have

CC increased biological activity with(out) heparin, and promote

CC cell growth.

SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;

Best Local Similarity 93.8%; Pred. No. 6.60e-81;

Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPFGNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSGTNPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKNGS 116

QY 98 QYLANDTDGLLYGSGTNPNEECFLERLEEAPAPNHYNTYISKHAEKNWFVGLKNGS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSGTNPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKNGS 116

QY 98 QYLANDTDGLLYGSGTNPNEECFLERLEEAPAPNHYNTYISKHAEKNWFVGLKNGS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

RESULT

ID R74647 standard; protein; 140 AA.

AC R74647;

DE 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis;

KW mitogen.

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PF 24-DEC-1984; US-685923.

PR 24-DEC-1984; US-685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1986; US-190293.

PR 08-FEB-1991; US-654397.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

PI WPI; 93-138983/18.

PT New recombinant human acidic fibroblast growth factor - used to

PT promote cell growth, to promote wound healing, for vascular

PT grafts and blood vessel repair

PS Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid

CC sequence of bovine acidic fibroblast growth factor (aFGF) and

CC used to produce a synthetic gene (given in Q88233) incorporating

CC codons preferred by E. coli or mammalian cells, unique cloning

CC sites, etc. This synthetic gene was mutagenized to obtain a gene

CC encoding a human recombinant aFGF (R74647) having activity

CC equivalent to the native protein.

SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;

Best Local Similarity 93.8%; Pred. No. 6.60e-81;

Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPFGNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSGTNPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKNGS 116

QY 98 QYLANDTDGLLYGSGTNPNEECFLERLEEAPAPNHYNTYISKHAEKNWFVGLKNGS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

RESULT

ID W04806 standard; protein; 140 AA.

AC W04806;

DE 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;

KW Heparin-Sepharose affinity chromatography; probe; oligonucleotide;

KW FGF; fibroblast growth factor; ss.

OS Homo sapiens.

PN US552528-A.
PD 03-SEP-1996. 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON) RHONE POULENC RORER PHARM INC.
PI Burgess W. Macias T;
DR WPI: 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PS Disclosure; Fig 8: 28pp; English.
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 63 QYLANDTGLLYGSQTPNEECFLERLEE-----NHYNTYISKHAEKNWVGLKKNGS 116
QY 98 QYLANDTGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKHAEKNWVGLKKNGS 157

Db 117 CKRGPRTHYGOKAILFLPLPVSSD 140
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 6
ID P70995 standard; protein; 140 AA.
AC P70995;
DT 13-JUN-1991 (first entry)
DE Sequence of human proteinaceous factor (pF1) with mitogenic activity.
DE Cell growth promoter; mitogen; vascularisation; wound healing.
DE Homo sapiens.
FT misc_difference 140
FT key Location/Qualifiers
FT misc_difference 140 /label= Asp-OH
PN EP-241136-A.
PD 14-OCT-1987.
PF 06-MAR-1987; 301969.
PR 07-MAR-1986; US-838096.
PA (HARD) HARVARD COLLEGE.
PI Lobb RR, Harper JW, Strydom DJ;
DR WPI: 87-285995/41.
PT Mitogenic polypeptide isolated from human brain tissue - useful
PT for increasing vascular effect in eg wound healing, or
PT generating endothelial cell linings for vascular prostheses, etc.
PS Claim 3; Page 1; 31pp; English.
CC The PF of the invention was obtd. from human brain tissue. It has a
CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high
CC affinity for heparin. PF1 and fragments are useful for promoting the
CC growth of mesoderm-derived cells or neuroectoderm-derived cells and
CC generating endothelial cell linings for vascular prostheses (all
CC claimed). The polypeptides are useful for increasing vascularisation.
SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 63 QYLANDTGLLYGSQTPNEECFLERLEE-----NHYNTYISKHAEKNWVGLKKNGS 116
QY 98 QYLANDTGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKHAEKNWVGLKKNGS 157

Db 117 CKRGPRTHYGOKAILFLPLPVSSD 140
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 7
ID R10527 standard; Protein; 141 AA.
AC R10527;
DT 15-APR-1991 (first entry)
DE Human acidic fibroblast growth factor gene.
DE aFGF; antibody; antigen; cancer; ss.
KW Homo sapiens.
FH key Location/Qualifiers
FH region 2..12
FT /label= A
FT region 56..67
FT /label= B
FT region 104..114
FT /label= C
FT region 132..141
FT /label= D
PN J02306996-A.
PD 20-DEC-1990.
PF 03-JUL-1989; 172542.
PR 04-JUL-1988; JP-166275.
PR 03-JUL-1989; JP-172542.
PA (TAKE) TAKEDA CHEMICAL IND KK.
DR WPI: 91-040150/06.
DR N-PSDB; Q10399.
PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by
PT using complex of partial peptide(s) of acid fibroblast growth
PT factor and protein as antigen.
PS Disclosure; Fig 1; 19pp; Japanese.
CC The was deduced from a gene used to produce recombinant aFGF.
CC Peptides derived from the protein, esp. from A-D can be used to as
CC antigens to produce anti-aFGF antibodies. The peptides must
CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),
CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D
CC (claim 8). The AAs can be used for immunochemically measuring aFGF,
CC and for purifying aFGF. They are useful as reagents in the diag-
CC nosis of various cancers or diseases of the CNS. Purified aFGF
CC has wound healing and nerve cell proliferating properties.
SQ Sequence 141 AA;

Query Match 70.8%; Score 920; DB 1; Length 141;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 4 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 63
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 64 QYLANDTGLLYGSQTPNEECFLERLEE-----NHYNTYISKHAEKNWVGLKKNGS 117
QY 98 QYLANDTGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKHAEKNWVGLKKNGS 157

Db 118 CKRGPRTHYGOKAILFLPLPVSSD 141
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 8

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ID R05789 standard; Protein; 151 AA.
AC R05789;
DT 22-AUG-1990 (first entry)
DE Human aFGF encoded by synthetic gene.
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;
KW atherosclerosis; tumors.
OS Synthetic.
FH Key Location/Qualifiers
FT misc_difference 146..147
FT /note="sites corresp. to two stop codons of
FT the DNA sequence"
PN GB2223496-A.
PD 11-APR-1990.
PF 08-AUG-1988; 018775.
PR 08-AUG-1988; GB-018775.
PA (BRBI-) Brit Bio-Tech Ltd.
PI Davies JA, Johnson ID;
DR WPI: 90-109882/15.
N-PSDB; Q03873.
Gc Gene encoding human acidic fibroblast growth factor -
Gc incorporates useful restriction sites at frequent intervals to
Gc facilitate cassette mutagenesis of specified regions.
PS Claim 2; Fig 3a; 12pp; English.
CC The synthetic aFGF gene incorporates useful restriction sites at
CC frequent intervals to facilitate the cassette mutagenesis of
CC selected regions. Also included are flanking sites to simplify
CC the incorporation of the gene into any expression system.
CC The aFGF mol. acts in a cascade effect to control endothelial cell
CC activity either co-ordinately through synergistic effects or via
CC independent routes. The regulation of endothelial cells is essential
CC for the protection of arteries, veins and capillaries from the effect
CC of thrombogenesis. Their stimulation and control by these factors is
CC also thought to be important in the development of tumours and
CC atherosclerosis.
SQ Sequence 151 AA;

Query Match 70.8%; Score 920; DB 1; Length 151;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 17 LPPGNYKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 76
QY | :|||||
38 LLDANYKKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97
Db 77 QYLAAMDGLLYGSQTPNEECFLERLEE-----NHNTYISKKHAENWVGLKKNKS 130
QY | :|||||
98 QYLAAMDGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKKHAENWVGLKKNKS 157
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154
QY | :|||||
158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 10
ID W04805 standard; Protein; 154 AA.
AC W04805;
DT 29-DEC-1996 (first entry)
DE Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON ) RHONE POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI: 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PT disclosure; Fig 8; 28pp; English.
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 17 LPPGNYKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 76
QY | :|||||
122 CKRGPRTHYGOKAILFLPLPVSSD 145
QY | :|||||
158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 9
ID W02283 standard; protein; 154 AA.
AC W02283;
DT 20-APR-1999 (first entry)
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
KW regenerate; blood vessel; endothelial cell; human.
OS Homo sapiens.
PN US5849538-A.
PD 15-DEC-1998.
PF 11-APR-1997; 840088.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PR 11-APR-1997; US-840088.
PA (RHON ) RHONE-POULENC RORER PHARM INC.

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PI Burgess W, Drohan WN, Jaye M, Maciag T;
DR WPI: 93-069734/05.
DT DNA encoding a cleavable signal peptide and an endothelial cell
PT growth factor - useful for producing recombinant endothelial cell
PT growth factor proteins
PS Claim 1; Column 16; 23pp; English.
CC This represents the amino acid sequence of human beta-endothelial cell
CC growth factor (ECGF). The invention is directed to DNA encoding alpha-
CC or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a
CC cleavable signal peptide and an ECGF, where removal of the signal peptide
CC yields a mature form of the ECGF. The DNA is used to produce recombinant
CC ECGF proteins, which can be used in treatments to repair or regenerate
CC blood vessels or other structures lined with endothelial cells.
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 17 LPPGNYKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 76
QY | :|||||
38 LLDANYKKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97
Db 77 QYLAAMDGLLYGSQTPNEECFLERLEE-----NHNTYISKKHAENWVGLKKNKS 130
QY | :|||||
98 QYLAAMDGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKKHAENWVGLKKNKS 157
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154
QY | :|||||
158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 10
ID W04805 standard; Protein; 154 AA.
AC W04805;
DT 29-DEC-1996 (first entry)
DE Human beta-endothelial cell growth factor.
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;
KW FGF; fibroblast growth factor.
OS Homo sapiens.
PN US552528-A.
PD 03-SEP-1996.
PF 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PA (RHON ) RHONE POULENC RORER PHARM INC.
PI Burgess W, Maciag T;
DR WPI: 96-412132/41.
DR N-PSDB; T37503.
PT Isolated, purified, biologically active bovine beta endothelial cell
PT growth factor - useful to regenerate or treat damaged blood vessels
PT disclosure; Fig 8; 28pp; English.
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine
CC brain using heparin-Sepharose affinity chromatography. ECGF is
CC useful for, among other purposes, diagnostic applications and has
CC potential in the treatment of damaged blood vessels or other
CC endothelial cell-lined structures.
CC Human ECGF (T37503) or fragments may be obtained using
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based
CC on the sequence of bovine alpha- and beta-ECGF.
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 17 LPPGNYKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 76
QY | :|||||

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QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 130
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEEATPAPNHNTYISKHAEKNFVGLKKNKS 157
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154
QY* 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 11
ID W06816 standard; Protein; 154 AA.
AC W06816;
DT 17-MAR-1997 (first entry)
DE Human endothelial cell growth factor-beta.
KW Endothelial cell growth factor-beta; ECGF-beta.
OS Homo sapiens.
PA US5571790-A.
PR 05-NOV-1996.
PR 03-MAR-1986; 835594.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, MacIag T;
DR WPI: 96-505421/50.
DR N-PSDB: T45983.
PT Recombinant human endothelial cell growth factors - for treating
PS Claim 1; Column 16; 22pp; English.
CC Human recombinant endothelial cell growth factors (ECGF) beta
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.
CC They can be produced in transformed prokaryotic or eukaryotic host
CC cells using DNA sequences (T45983 and T45984, respectively) derived
CC from the complete human ECGF cDNA (T45985). Large quantities of
CC the ECGFs are produced by culturing the host cells and recovering
CC the proteins. ECGFs have utility in the growth and amplification
CC of endothelial cells in culture. They can potentially be used to
CC treat damaged blood vessels and other endothelial cell-lined
CC structures, and also have diagnostic applns.
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

QY 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 76
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 130
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEEATPAPNHNTYISKHAEKNFVGLKKNKS 157
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 13
ID P94037 standard; protein; 155 AA.
AC P94037;
DT 25-JUN-1990 (first entry)
DE Human acidic fibroblast growth factor.
KW Acidic fibroblast growth factor.
OS Homo sapiens.
PN EP-298723-A.
PD 11-JAN-1989.
PR 06-JUL-1988; 306158.
PR 07-JUL-1987; US-070797.
PA (BIOT-) Biotechn Res Assoc.
PI Fiddes JC, Abraham JA, Protter A;
DR WPI: 89-009785/02.
DR N-PSDB: N93088;
PT Recombinant DNA encoding new fibroblast growth factor
PT analogues - useful eg for accelerating wound healing and
PT to control neovascularisation.
PS Disclosure; p; English.
CC See also P94038.
SQ Sequence 155 AA;

Query Match 70.8%; Score 920; DB 1; Length 155;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

QY 18 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 77
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 97
Db 78 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 131

PF 04-NOV-1996; 743261.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PA (RHON) RHONE-POULENC RORER PHARM INC.
PI Burgess W, Drohan WN, Jaye M, MacIag T;
DR WPI: 98-594032/50.
PT Compositions for promoting wound healing - containing endothelial
PT cell growth factor polypeptides
PS Claim 1; Column 16; 23pp; English.
CC This sequence represents the amino acid sequence of the mature human
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
CC is identical to the alpha-ECGF but the beta sequence contains an extra
CC 20 N-terminal amino acids. The sequence was isolated from a human brain
CC stem cell cDNA library using a probe designed based on fragments of the
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in
CC compositions for promoting wound healing. ECGF is also used to grow
CC cells on a prosthetic device.
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 76
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 97
Db 77 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 130
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEEATPAPNHNTYISKHAEKNFVGLKKNKS 157
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 13
ID P94037 standard; protein; 155 AA.
AC P94037;
DT 25-JUN-1990 (first entry)
DE Human acidic fibroblast growth factor.
KW Acidic fibroblast growth factor.
OS Homo sapiens.
PN EP-298723-A.
PD 11-JAN-1989.
PR 06-JUL-1988; 306158.
PR 07-JUL-1987; US-070797.
PA (BIOT-) Biotechn Res Assoc.
PI Fiddes JC, Abraham JA, Protter A;
DR WPI: 89-009785/02.
DR N-PSDB: N93088;
PT Recombinant DNA encoding new fibroblast growth factor
PT analogues - useful eg for accelerating wound healing and
PT to control neovascularisation.
PS Disclosure; p; English.
CC See also P94038.
SQ Sequence 155 AA;

Query Match 70.8%; Score 920; DB 1; Length 155;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 18 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 77
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDRSDQHIQLLSAESVGEVYIKSTETG 97
Db 78 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 131

QY	98	QY	LAMTDGLLYGSQTPNEECFLERLEEAAPAPNHYNTYISKHAEKNWFVGLKNGS	157
Db	132	CKRGRTHYGQKAILFLPVSDD	155	
QY	158	CKRGRTHYGQKAILFLPVSDD	181	

RESULT 14

ID	R70812	standard; protein; 155 AA.
AC	R70812;	
AD	01-SEP-1995	(first entry)
DE	FGF-1.	
KW	FGF-1;	fibroblast growth factor; cytotoxic conjugate; fusion protein;
KW	saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.	
OS	Homo sapiens.	
FH	Key	Location/Qualifiers
FT	misc_difference 31	
FT	misc_difference 132	/note= "cys may be replaced by Ser"
FT	misc_difference 132	/note= "cys may be replaced by Ser"
PP	WO9503831-A.	
PP	09-FEB-1995.	
PF	27-JUL-1994;	U08511.
PR	02-AUG-1993;	US-099924.
PR	25-OCT-1993;	US-145829.
PR	(PR12-)	PRIZM PHARM INC.
PA	(WHIT-) WHITTIER INST	DIABETES & ENDOCRINOLOGY.
PA	Baird AJ, Lappi DA, Sosnowski BA;	
PI	WPI; 95-082038/11.	
PT	New monogenic preparations of cytotoxic conjugates and DNA -	
PT	contain fibroblast growth factors and cytotoxic agents for	
PT	treating FGF conditions such as tumours, diabetes and rheumatoid	
PT	arthritis.	
PS	Disclosure; Page 108-109; 128pp; English.	
CC	Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9	
CC	may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or	
CC	FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced	
CC	by conservative Ser substitutions. The fusion proteins are potent	
CC	cytotoxic agents to cells bearing the FGF receptor.	
SC	Sequence 155 AA;	

Query Match 70.88; Score 920; DB 1; Length 155;
Best Local Similarity 93.88; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db	18	LPPGNVKKPLLKXCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVYIKSTETG	77
		:	
(38	LLDANYKKPLLKXCSNGGHFLRILPDGTVDRDRSDQHIQLQLSAESVGEVYIKSTETG	97
	78	QYLAMTDGLLYGSQTNEECLFLERLEE-----NHYNTYISKKHAENWFVGLKKNKS	131
Qy	98	QYLAMTDGLLYGSQTNEECLFLERLEEAAPAPNHYNTYISKKHAENWFVGLKKNKS	157
Db	132	CKRGRPRTHYGOKAILFLPLPVSSD	155
Qy	158	CKRGRPRTHYGOKAILFLPLPVSSD	181

RESULT 15

RESULT	13	
ID	P70482	standard; Protein; 155 AA.
AC	P70482;	
DT	13-MAY-1991	(first entry)
DE	Sequence encoded by complete cDNA sequence of human endothelial cell growth factor (ECGF).	
DE	Endothelial cell regeneration; blood vessel regeneration.	
KW	Homo sapiens.	
OS	Homo sapiens.	
PH	Key	Location/Qualifiers
FT	protein	2..15
FT		/label= Beta ECGF
FT	protein	16..21
FT		/label= Acidic FGF
FT	protein	22..155
FT		/label= Alpha ECGF

PN WO8705332-A.
PD 11-SEP-1987.
PE 02-MAR-1987; U00425.
PR 03-MAR-1986; US-835594.
PR 26-MAR-1987; ES-000812.
PA (MELO-) MELOY LAB INC.
PA (RORE-) RORER BIOTECHN INC.
PA (RORE-) RORER.
PA BIOTECH INC.
PI Jaye M, Burgess W, Maciag T, Drohan W;
DR WPI; 87-264128/37.
DR N-PSDB; N70788.
PT Human endothelial cell growth factor - produced by recombinant
PT DNA techniques; useful for wound healing
PS Example; Fig 8; 43pp; English.
CC To screen the human brain stem cDNA library for clones contg. ECGF
CC inserts, a specific oligonucleotide was designed. This
CC oligonucleotide was based upon a partial AA sequence analysis of
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
CC forth for comparison the AA sequence of cyanogen bromide-cleaved
CC bovine alpha and beta ECGF (P70834). The two clones that were
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The
CC nucleotide sequence of these clones and the AA sequence deduced from
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
SQ Sequence 155 AA;

Query Match	70.88	Score 920	DB 1	Length 155
-------------	-------	-----------	------	------------

Query Match 70.8%; Score 924; DB 1; Length 155; Best Local Similarity 93.8%; Pred. No. 6.60e-81; Mismatches 1; Indels 6; Gaps 1; Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 18 L P G N Y K K P K L L Y C S N G G H F L R I L P D G T V D G T R D R S D Q H I Q L S A E S V G E Y I K S T E T G 77
 | : ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | ||||| | |||||
Ov 38 L D A N Y K K P K L L Y C S N G G H F L R I L P D G T V D G T R D R S D Q H I Q L S A E S V G E Y I K S T E T G 97

QY	36	LLDANIKAFADLICSGNGHFKLLPDLGVDTKORSQHQIQLQLSAEASVGEVIRASIEIG
Db	78	QYLAMDTDGLLYGSQTPNEECFLERLEE-----NHNTYISKKHAENWFVGLKNGS

QY 98 QYLANDTGLLYGSTPNEECFLERLEEAATPAPNHNTYISKHAEKNWFGLKNGS 157

Db 132 CKRGPRTHYGQKAILFLPLPVSSD 155

D3	132	CKKNSFNTHGQKRAIEFFEFVSSD	133
QV	158	CKRGPRTHYGOKAILEFLPLPVSSD	181

Search completed: Tue Aug 29 15:48:52 2000
Job time : 24 secs.

 W P S R L A
 (TM)

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Msrch_pp protein - protein database search, using Smith-Waterman algorithm
 on: Tue Aug 29 15:47:36 2000; MasPar time 11.25 seconds
 758.757 Million cell updates/sec
 Molecular output not generated.

Title: >US-09-121-017B-5
 Description: (1-F81) from US09121017B.pep
 Perfect Score: 1300
 Sequence: 1 MSRGAGRVQGTQALVELGV.....PRTHYGOKAILFLPLPVSSD 181

Scoring table: PAM 150
 Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%
 Listing first 45 summaries

Database: pir64
 1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 43.426; Variance 76.019; scale 0.571

Pred. No. is the number of results predicted by chance to have a
 score greater than or equal to the score of the result being printed,
 and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.	
1	920	70.8	155	1	A33665	acidic fibroblast gro	1.49e-182
2	903	69.5	155	1	A60721	acidic fibroblast gro	1.58e-178
3	900	69.2	155	2	D37360	acidic fibroblast gro	8.10e-178
4	900	69.2	155	2	S04147	acidic fibroblast gro	8.10e-178
5	889	68.4	152	2	JH0476	acidic fibroblast gro	3.24e-175
6	851	65.5	155	1	GKBOA	acidic fibroblast gro	3.07e-166
7	850	65.4	155	2	A60130	acidic fibroblast gro	5.29e-166
8	840	64.6	155	2	JW0055	fibroblast growth fac	1.21e-163
9	464	35.7	189	2	A48834	basic fibroblast gro	1.76e-76
10	458	35.2	157	1	GKBOB	basic fibroblast gro	3.99e-75
11	453	34.8	146	1	S00185	basic fibroblast gro	5.35e-74
12	451	34.7	210	2	A32398	basic fibroblast gro	1.51e-73
13	449	34.5	154	2	A31674	basic fibroblast gro	4.26e-73
14	445	34.2	154	2	C37360	basic fibroblast gro	3.39e-72
15	439	33.8	184	2	S31622	basic fibroblast gro	7.56e-71
16	427	32.8	155	1	A40117	basic fibroblast gro	3.72e-68
17	407	31.3	137	2	I46711	fibroblast growth fac	1.09e-63
18	305	23.5	208	2	A48137	fibroblast growth fac	2.39e-41
19	305	23.5	208	2	S66486	fibroblast growth fac	2.39e-41
20	285	21.9	207	2	JC5941	fibroblast growth fac	4.40e-37
21	280	21.5	207	2	JC5940	fibroblast growth fac	5.03e-36
22	275	21.2	208	2	S14192	fibroblast growth fac	5.72e-35
23	267	20.5	60	2	JH0708	fibroblast growth fac	2.75e-33

ALIGNMENTS

RESULT	ENTRY	24	262	20.2	220	2	I50588	FGF-3 - chicken	3.06e-32
	TITLE	25	248	19.1	237	1	S39582	transforming protein	2.49e-29
	ALTERNATE_NAMES	26	243	18.7	194	2	S49501	keratinocyte growth f	2.68e-28
	ORGANISM	27	243	18.7	208	2	S20102	fibroblast growth fac	2.68e-28
	DATE	28	240	18.5	194	1	A36301	fibroblast growth fac	1.11e-27
	ACCESSIONS	29	240	18.5	239	1	S04742	fibroblast growth fac	1.11e-27
	REFERENCE	30	239	18.4	264	2	A36207	transforming protein	1.78e-27
	#authors	31	239	18.4	266	2	S68144	fibroblast growth fac	1.78e-27
	#journal	32	238	18.3	187	2	S23595	embryonic fibroblast	2.85e-27
	#title	33	238	18.3	245	1	TVNST2	transforming protein	2.85e-27
	#cross-references	34	236	18.2	194	2	I48610	keratinocyte growth f	7.32e-27
	#molecule_type	35	234	18.0	194	2	S26049	fibroblast growth fac	1.88e-26
	#residues	36	234	18.0	267	1	TVHUF5	transforming protein	1.88e-26
	#cross-references	37	227	17.5	168	2	G0184	fibroblast growth fac	5.00e-25
	#molecule_type	38	225	17.3	192	2	S54407	embryonic fibroblast	1.27e-24
	#residues	39	224	17.2	194	2	I50710	fibroblast growth fac	2.03e-24
	#cross-references	40	224	17.2	256	2	JC4627	fibroblast growth fac	2.03e-24
	#molecule_type	41	222	17.1	206	2	JC4268	HST protein - bovine	5.14e-24
	#residues	42	202	15.5	206	1	TVHUS	fibroblast growth fac	5.09e-20
	#cross-references	43	181	13.9	202	1	TVMSHS	transforming protein	6.23e-16
	#molecule_type	44	174	13.4	97	2	B46289	keratinocyte growth f	1.34e-14
	#residues	45	173	13.3	125	2	A32484	basic fibroblast grow	2.08e-14

A33665 #type complete
 acidic fibroblast growth factor 1 precursor - human
 beta-ECGF; endothelial cell growth factor beta;
 heparin-binding growth factor 1
 #formal_name Homo sapiens #common_name man
 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
 A33665; A32316; S18217; A43804; A24662; JH0707; S35535;
 S35536; I39413; A23553; A24820; A24343; A24301; A26386;
 A33665
 Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.;
 Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes,
 J.C.
 Biochem. Biophys. Res. Commun. (1989) 164:1121-1129
 Structural analysis of the gene for human acidic fibroblast
 growth factor.
 #cross-references MUID:90073637
 #accession A33665
 #molecule_type DNA
 #residues 1-155 #label MER
 #cross-references GB:M30491
 A32316
 Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu,
 I.M.
 Mol. Cell. Biol. (1989) 9:2387-2395
 Cloning of the gene coding for human class 1 heparin-binding
 growth factor and its expression in fetal tissues.
 #cross-references MUID:89343957
 #accession A32316
 #molecule_type DNA
 #residues 1-155 #label WAN
 #cross-references GB:M23087; NID:gl83875; PIDN:AAA52638.1; PID:g386768
 S18217
 Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.;
 Chiu, I.M.
 Oncogene (1991) 6:1521-1529
 Cloning and sequence analysis of the human acidic fibroblast
 growth factor gene and its preservation in leukemia
 patients.
 #cross-references MUID:92019819
 S18217
 #accession
 #molecule_type DNA
 #residues 1-155 #label WA2
 #cross-references EMBL:M23086
 A43804
 REFERENCE

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#authors Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal Oncogene (1990) 5:755-762
#title Alternative splicing generates two forms of mRNA coding for
#human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession A43804
##molecule_type mRNA
##residues 1-155 #label CHI
##cross-references ENBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#authors Jaye, M.; Hawk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
Drohan, W.N.
#journal Science (1986) 233:541-545
#title Human endothelial cell growth factor: cloning, nucleotide
sequence, and chromosome localization.
#cross-references MUID:86261805
#accession A24662
##molecule_type mRNA
##residues 1-155 #label JAY
##cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#authors Yu, Y.L.; Kha, H.; Golden, J.A.; Migchelsen, A.A.J.; Goetzl,
E.J.; Turck, C.W.
#journal J. Exp. Med. (1992) 175:1073-1080
#title An acidic fibroblast growth factor protein generated by
alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession JH0707
##molecule_type mRNA
##residues 1-155 #label YUY
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#authors Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
S.E.; Myers, R.L.; Chiu, I.M.
#journal Nucleic Acids Res. (1993) 21:489-495
#title Cloning of two novel forms of human acidic fibroblast growth
factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession S35535
##status translation not shown
##molecule_type mRNA
##residues 1-58 #label PAY
##cross-references GB:L01485
#accession S35536
##status translation not shown
##molecule_type mRNA
##residues 1-58 #label PA2
##cross-references GB:L01487
REFERENCE
#authors Crumley, G.; Dionne, C.A.; Jaye, M.
#journal Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title The gene for human acidic fibroblast growth factor encodes
two upstream exons alternatively spliced to the first
coding exon.
#cross-references MUID:90365758
#accession I39413
##status translation not shown
##molecule_type mRNA
##residues 1-40 #label RES
##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
GB:M60516; NID:g178233; PID:g553171
REFERENCE
#authors Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession A23553
##molecule_type protein
##residues 16-155 #label HAR
REFERENCE
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title The complete amino acid sequence of human brain-derived

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acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession A24820
##molecule_type protein
##residues 16-155 #label GIM
REFERENCE
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession A24243
##molecule_type protein
##residues 16-47 #label GI2
##experimental_source brain
REFERENCE
#authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession A24301
##molecule_type protein
##residues 16-30, 'X', 32-49 #label GAU
REFERENCE
#authors Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession A26386
##molecule_type protein
##residues 16-155 #label GA2
##experimental_source brain
REFERENCE
#authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
##molecule_type protein
##residues 16-30, 'X', 32-38; 73-75, 'X', 77-97, 'X', 99-101; 128-131, 'X',
133-140, 'X', 142-152 #label CHA
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#gene GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
16-155 #product fibroblast growth factor 1 #status experimental
129 #label MAT\
#binding_site carbohydrate (Asn) (covalent) #status
absent
SUMMARY
#length 155 #molecular_weight 17460 #checksum 9243
Query Match 70.88; Score 920; DB 1; Length 155;
Best Local Similarity 93.88; Pred. No. 1.49e-182;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;
Db 18 LPPGNTKKPKLLYCSNGGHPRLILPDGTVDGTRDRSDQHIQLQLSAESVGVKSTETG 77
| : |||||
QY 38 LLDANYKKPKLLYCSNGGHPRLILPDGTVDGTRDRSDQHIQLQLSAESVGVKSTETG 97
| : |||||
Db 78 OYLAMTDGLLYGSQTPNEECFLERLEE-----NHYNTYISKKAENKWFVGLKNGS 131
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QY 98 OYLAMTDGLLYGSQTPNEECFLERLEEAAATPAPNHYNTYISKKAENKWFVGLKNGS 157
| : |||||

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Db 132 CRRGPRTHYGQKAILFLPLPVSSD 155
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Qy 158 CRRGPRTHYGQKAILFLPLPVSSD 181

RESULT 2
ENTRY
TITLE A60721 #type complete
ALTERNATE_NAMES acidic fibroblast growth factor - golden hamster
ORGANISM heparin-binding growth factor 1
DATE #formal_name Mesocricetus auratus #common_name golden hamster
10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999

ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.

#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene and cDNA and its modulation by steroids.

#cross-references MUID:90270291
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

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Best Local Similarity 91.7%; Pred. No. 1.58e-178;
Matches 132; Conservative 2; Mismatches 4; Indels 6; Gaps 1;

Db 18 LPPGNYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESAGEVYIKGTETG 77
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Qy 38 LLDANYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESAGEVYIKSTENG 97
| - |||||

Db 78 QYLANDTDGLLYGSQTPNEECFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNKS 131
|||||
Qy 98 QYLANDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYTSKKHAEKNWFVGLKKNKS 157
|||||

Db 132 CRRGPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 158 CRRGPRTHYGQKAILFLPLPVSSD 181
|||||

RESULT 3
ENTRY
TITLE D37360 #type complete
ALTERNATE_NAMES acidic fibroblast growth factor - mouse
ORGANISM aFGF; FGF-1
DATE #formal_name Mus musculus #common_name house mouse
17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999

ACCESSIONS D37360; JC5231
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.

#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.

#cross-references MUID:90201563
#accession D37360
#status preliminary

#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
JC5231

#authors Madai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 69.2%; Score 900; DB 2; Length 155;
Best Local Similarity 92.2%; Pred. No. 8.10e-178;
Matches 130; Conservative 3; Mismatches 2; Indels 6; Gaps 1;

Db 21 GNYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESAGEVYIKGTETGOYL 80
: |||||
Qy 41 ANYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESAGEVYIKSTETGOYL 100
: |||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNKSGCKR 134
|||||
Qy 101 AMDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYTSKKHAEKNWFVGLKKNKSGCKR 160
|||||

Db 135 GPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 161 GPRTHYGQKAILFLPLPVSSD 181
|||||

RESULT 4
ENTRY
TITLE S04147 #type complete
ALTERNATE_NAMES acidic fibroblast growth factor 1 - rat
ORGANISM heparin-binding growth factor 1
DATE #formal_name Rattus norvegicus #common_name Norway rat
28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999

ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).

#cross-references MUID:89240051
#accession S04147

#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352

CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 69.2%; Score 900; DB 2; Length 155;
Best Local Similarity 92.2%; Pred. No. 8.10e-178;
Matches 130; Conservative 3; Mismatches 2; Indels 6; Gaps 1;

Db 21 GNYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESAGEVYIKGTETGOYL 80
: |||||
Qy 41 ANYKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESAGEVYIKSTETGOYL 100
: |||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNKSGCKR 134
|||||
Qy 101 AMDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYTSKKHAEKNWFVGLKKNKSGCKR 160
|||||

Db 135 GPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 161 GPRTHYGQKAILFLPLPVSSD 181
|||||

RESULT 5
ENTRY
TITLE JH0476 #type fragment
ALTERNATE_NAMES acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS      JH0476; S20072
REFERENCE
#authors      Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal      Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title        Amplification and sequencing of mRNA encoding acidic
#             fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession     JH0476
#molecule_type mRNA
#residues      1-152 #label SCH
##cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
##experimental_source heart
#note          the hydrophobic core residues are packed around the
               internal symmetry axis
COMMENT        This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS        growth factor; heparin binding
FEATURE
22-28          #region nuclear location signal\
133            #binding_site heparin (lys) #status predicted
SUMMARY        #length 152 #checksum 1124
               68.4%; Score 889; DB 2; Length 152;
               Best Local Similarity 91.5%; Pred. No. 3.24e-175;
               Matches 129; Conservative 2; Mismatches 4; Indels 6; Gaps 1;

Db 18 LPPGNYKKPKLLVCSNGGFLRLPDGTVDGTRDRSDHQLQLSASVGEVYIKSTEG 77
   | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy 38 LLDANYKKPKLLVCSNGGFLRLPDGTVDGTRDRSDHQLQLSASVGEVYIKSTEG 97
   | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Db 78 QYLA MDTGLLYGSGTPSECLFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNGS 131
   | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy 98 QYLA MDTGLLYGSGTPSECLFLERLEEATPAPNHYNTYTSKKHAEKNWFVGLKKNGS 157
   | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Db 132 CKRGPRTHYGOKAILFLPLPV 152
   | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy 158 CKRGPRTHYGOKAILFLPLPV 178
   | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

RESULT 6
ENTRY      GKBOA #type complete
TITLE      acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
                factor I; prostatin
ORGANISM    #formal_name Bos primigenius taurus #common_name cattle
DATE        13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
#cross-references MUID:92246990
#accession     JH0613
#molecule_type DNA
#residues      58-155 #label REN
REFERENCE
#authors      Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
#journal      Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title        Heterogeneity of 3' untranslated region of bovine acidic FGF
               transcripts.
#cross-references MUID:92246990
#accession     JH0613
#molecule_type DNA
#residues      58-155 #label REN
REFERENCE
#authors      Halley, C.; Courtois, Y.; Laurent, M.
#journal      Nucleic Acids Res. (1988) 16:10913
#title        Nucleotide sequence of bovine acidic fibroblast growth factor
               cDNA.
#cross-references MUID:89083506
#accession     S02102
#molecule_type mRNA
#residues      1-155 #label HAL
##cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE
#authors      Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal      FEBS Lett. (1988) 242:41-46
#title        Characterization of a bovine acidic FGF cDNA clone and its
               expression in brain and retina.
#cross-references MUID:89078619
#accession     S02661
#molecule_type mRNA
#residues      1-155 #label ALT
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE
#authors      Philippe, J.M.
#submission    submitted to the EMBL Data Library, May 1992
#accession     S22065
#molecule_type mRNA
#residues      1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
#authors      Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
               J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal      Science (1986) 233:545-548
#title        Nucleotide sequence of a bovine clone encoding the angiogenic
               protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession     B24663
#molecule_type mRNA
#residues      62-102 #label ABR
REFERENCE
#authors      Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
               M.; Disalvo, J.; Thomas, K.
#journal      Science (1985) 230:1385-1388
#title        Brain-derived acidic fibroblast growth factor: complete amino
               acid sequence and homologies.
#cross-references MUID:86070224
#accession     A94281
#molecule_type protein
#residues      16-155 #label GIM
REFERENCE
#authors      Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
               N.; Sharma, H.S.; Schaper, W.
#journal      Eur. J. Biochem. (1989) 181:67-73
#title        Isolation of heparin-binding growth factors from bovine,
               porcine and canine hearts.
#cross-references MUID:89231704
#accession     S03953
#molecule_type protein
#residues      16-45 #label QUI
REFERENCE
#authors      Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal      EMBO J. (1985) 4:1951-1956
#title        Acidic fibroblast growth factor (FGF) from bovine brain:
               amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession     A91010
#molecule_type protein
#residues      16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE
#authors      Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
               G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal      Biochemistry (1986) 25:4988-4993
#title        Complete primary structure of prostatin, a prostate
               epithelial cell growth factor.
#cross-references MUID:87026586
#accession     A24477
#molecule_type protein
#residues      2, 'GE', 5-155 #label CRA
REFERENCE
#authors      Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.;
               Maciag, T.
#journal      Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title        Structural evidence that endothelial cell growth factor beta
               is the precursor of both endothelial cell growth factor
               alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
Strydom, D.J.; Harper, J.W.; Lobb, R.R.
Biochemistry (1986) 25:945-951
Amino acid sequence of bovine brain derived class 1
heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR

REFERENCE
A60884
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.;
DiSalvo, J.
J. Protein Chem. (1987) 6:163-171
Primary structure and mitogenic and angiogenic activities of
brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO

REFERENCE
A37892
Kuo, M.D.; Huang, S.S.; Huang, J.S.
J. Biol. Chem. (1990) 265:16455-16463
Acidic fibroblast growth factor receptor purified from bovine
liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30, 'X', 32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76, 'X', 78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form
designated as brain-derived growth factor B

REFERENCE
A61198
Hall, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry,
I.A.
Brain Res. Dev. Brain Res. (1991) 63:13-19
Class 1 heparin binding growth factor promotes the
differentiation but not the survival of ciliary neurones in
vivo.
#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26; 28-50; 53-110, 'H', 112, 'NTY', 134-155 #label HIL

REFERENCE
I46024
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet,
J.; Courtois, Y.; Edwards, J.B.
Biochem. Biophys. Res. Commun. (1992) 188:843-850
Cloning of two different 5' untranslated exons of bovine
acidic fibroblast growth factor by the single strand
ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:9411; PIDN:CAA47063.1; PID:g412
#accession A34477
Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine
heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24, 121-127; 134-143 #label SAS
#experimental_source heart
COMMENT The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT This protein binds heparin, although less strongly than does bFGF.
There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the pig
...
Note: remainder of annotations omitted.

Query Match 65.5%; Score 851; DB 1; Length 155;
Best Local Similarity 87.9%; Pred. No. 3,07e-166;
Matches 124; Conservative 6; Mismatches 5; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGYFLRILPDGTVDGTRSDQHIQLQCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 41 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRSDQHIQLQCAESVGEVYIKSTETGYL 100

Db 81 AMDTDGLLYGSQTPNEECFLERLEE-----NHNYIYISKHAEKHWVGLKKNRSKL 134
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 101 AMDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYISKHAEKHWVGLKKNRSCKR 160

Db 135 GPRTHFGOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 161 GPRTHYGOKAILFLPLPVSSD 181

RESULT 7
ENTRY #type complete
TITLE A60130 acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373

REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY      #length 155 #molecular-weight 17322 #checksum 7617
Query Match   65.4%; Score 850; DB 2; Length 155;
Best Local Similarity 86.5%; Pred. No. 5.29e-166;
Matches 122; Conservative 6; Mismatches 7; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGKVDGTRDRSDQHQIQLQLSAESGEVYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQIQLQLSAESGEVYIKSTAGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEE-----NHYNTYISKHAKDNWVGLKKNKNSKL 134
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTGGLLYGSQTPNECLFLERLEEAAAPAPNHYNTYISKHAKDNWVGLKKNKNSCKR 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 135 GPRTHYGOKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 161 GPRTHYGOKAILFLPLPVSSD 181
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY fibroblast growth factor-1 - sheep
TITLE FGF-1
ALTERNATE_NAMES #formal_name Ovis sp. #common_name sheep
ORGANISM 17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
DATE 07-May-1999
ACCESSIONS JW0055
REFERENCE #authors Griebel, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.; Donjerko, D.; Chang, H.; Yun, J.; Subramanian, R.; Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess, W.H.
#journal Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title Primary structure of ovine fibroblast growth factor-1 deduced by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues 1-155 #label GRI
COMMENT This protein is a potent mitogenic factor for NIH 3T3 fibroblasts in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17557 #checksum 8890

Query Match 64.6%; Score 840; DB 2; Length 155;
Best Local Similarity 86.5%; Pred. No. 1.21e-163;
Matches 122; Conservative 8; Mismatches 5; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGKVDGTRDRSDQHQIQLQLSAESGEVYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQIQLQLSAESGEVYIKSTAGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEE-----NHYNTYISKHAKDNWVGLKKNKNSKL 134
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTGGLLYGSQTPNECLFLERLEEAAAPAPNHYNTYISKHAKDNWVGLKKNKNSCKR 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 135 GPRTHYGOKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 161 GPRTHYGOKAILFLPLPVSSD 181
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY #type complete
TITLE basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE #authors Borja, A.Z.; Meijers, C.; Zeller, R.
#journal Dev. Biol. (1993) 157:110-118
#title Expression of alternatively spliced bFGF first coding exons and antisense mRNAs during chicken embryogenesis.

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#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note NCBI backbone (NCBIN:131000, NCBI:P:131001)

REFERENCE S23636
#authors Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:G62855; PIDN:CAAA0139.1; PID:G62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 189 #molecular-weight 20312 #checksum 8538

Query Match 35.7%; Score 464; DB 2; Length 189;
Best Local Similarity 48.4%; Pred. No. 1.76e-76;
Matches 75; Conservative 30; Mismatches 42; Indels 8; Gaps 3;

Db 43 LPALPDGGGGGAFPGHFKDKRLYCKNGGFLRLNPGRVYGVREKSDPHIKLQQAEE 102
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 26 VPSPARAGAQGTLLDANKYKPKLLYCSNGGHFLRLPDGTVDRSDQHQIQLQLSAES 85
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 103 RGWSIKGVSANRFLAMKEDGRLLALKKATECEFFERLE-----S-NNYNTYRSKYSYD 156
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 86 VGEVYIKSTAGQYLAQTDGLLYGSQTPNECLFLERLEEAAAPAPNHYNTYISKHAE 145
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 157 --WYVALKRTGQYKPGKTPGQKAILFLPMSAKS 189
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 146 KNWFVGLKKNKSGKRGPRTHYGOKAILFLPLPVSS 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY #type fragment
TITLE basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES bFGF; kidney-derived growth factor; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS A24663; A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjertild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
#molecule_type mRNA
#residues 3-157 #label ABR
#cross-references GB:M13440; NID:G163049; PIDN:AAA30518.1; PID:G163050
#experimental_source pituitary gland
REFERENCE A90924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes, J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession A32878
#molecule_type mRNA
#residues 3-157 #label AB2
REFERENCE A33784
#authors Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel, N.R.; Deuel, T.F.

```



```

#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
        bovine uterus: purification and N-terminal amino acid
        sequence
#cross-references MUID:90121211
#accession A33784
#molecule_type protein
#residues 1-14 #label MIL
#note demonstration of a possible alternative initiator or
        splice junction
REFERENCE
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterisation and tissue localisation of an
        N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
#molecule_type protein
#residues 16-35 #label BER
#note A61551
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
        growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
#molecule_type protein
#residues 27-35, 'X', 37-41 #label UE3
#experimental_source testes
#note This form appears to be identical to the renal form
#accession A60310
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
        Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
        factor from bovine liver: structural homology with basic
        fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
#molecule_type protein
#residues 23-35, 'X', 37-42 #label UEN
#experimental_source liver
#note A24819
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
        fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
        composition matched what was thought to be the signal
        sequence
REFERENCE
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
        Böhlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
        gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
#molecule_type protein
#residues 12-25, 27-35, 'X', 37-40 #label GOS
#experimental_source adrenal gland
#note A01386
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
        L.; Klepper, R.; Gospodarowicz, D.; Böhlen, P.; Guillemin,
        R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
        factor (FGF) and comparison with the amino-terminal
        sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386

```

```

#molecule_type protein
#residues 12-157 #label ESC
#experimental_source pituitary gland
REFERENCE
#authors Baird, A.; Esch, F.; Böhlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
        growth factor from the bovine kidney: homology with basic
        fibroblast growth factor.
#cross-references MUID:86093426
#accession A60316
#molecule_type protein
#residues 27-35, 'X', 37-43 #label BAI
#experimental_source kidney
REFERENCE
#authors Böhlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
        fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
#molecule_type protein
#residues 12-26 #label BOH
#note The acidic and basic fibroblast growth factors are the major
        endothelial-cell growth factors. Both are angiogenic agents in
        vivo and are potent mitogens for a variety of mesoderm-derived
        cell types in vitro (although bFGF is 30-100 times more potent
        than aFGF in stimulating the proliferation of normal diploid
        cells).
#comment This protein binds heparin more strongly than does aFGF.
#classification #superfamily fibroblast growth factor
#keywords alternative splicing; angiogenesis; growth factor; heparin
        binding; mitogen
FEATURE
1-157 #product basic fibroblast growth factor, uterine form
        #status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
        form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
        form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
        form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
        #status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
        #status experimental #label MAT6\
29-33, 118-121 #region heparin binding #status predicted\
4 #modified_site blocked amino end (Ala) (in mature form
        pituitary gamma) (probably acetylated) #status
        experimental
SUMMARY
#length 157 #checksum 1115
Query Match 35.2%; Score 458; DB 1; Length 157;
Best Local Similarity 49.0%; Pred. NO. 3,99e-75;
Matches 76; Conservative 29; Mismatches 42; Indels 8; Gaps 3;
Db 11 LPALPDEGSGAPPCHPKDPRLYCKNGGFLRHPDGRVDGVRKSDPHKLGQJAE 70
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 26 VSPAGARAGATLLDANYKKPKLLYCSNGHFLRLPLDGTVDGTRDSQHIQLQJSAES 85
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 71 RGWSIKGVCANRYLAKMEDGRLLASKCVTDSCFFERLE-----S-NNYNTRYSRKYS- 123
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 86 VGEVIKSTGTQYLAAMDYDGLLYGSGQTPNECLFLEKEANPAPNHYNTYLKKHAE 145
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 124 -SWYVALRTGQYKLGPKTGPQKAILFLPMAS 157
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 146 KNWFGVLKNGSKRGPRTHYQKAILFLPLPVSS 180
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
RESULT 11
ENTRY #06185 #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatotropin

```

```

ORGANISM    #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE        10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS  S00185
REFERENCE    #authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabril, L.J.; Nice,
E.C.; Rubira, M.R.; Burgess, A.W.
#journal    FEBS Lett. (1987) 224:128-132
#title      Primary structure of ovine pituitary basic fibroblast growth
factor.
#cross-references MUID:88055577
#accession  S00185
#molecule_type protein
#residues   1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS     growth factor; heparin binding; mitogen
FEATURE      18-22 #region heparin binding #status predicted\
107-110      #region heparin binding #status predicted
#length 146 #molecular-weight 16434 #checksum 3560
#query Match 34.8%; Score 453; DB 1; Length 146;
Best Local Similarity 52.9%; Pred. NO. 5.35e-74;
Matches 74; Conservative 23; Mismatches 35; Indels 8; Gaps 3;

Db 15 GHFKDKRLCKNGGFLRLHPDGRVGVREKSDPHKQLQLOAERGWSIKGVCANRYL 74
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 41 ANYKKPLLYCSNGGFLRLPDGTVDGDRSDQHLQLSAESVGEVYIKSTETGOYL 100
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 75 AMKEDGRLASKGVTDCEFFERLE-----S--NNYNYRGRKYS--SWYVALKRTGOYKL 126
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 101 AMDTDGLLYGSQTNECLFLERLEERATPAPNHYNYISKHAEKNWVGLKNGSKCR 160
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 127 GPKTGPQOKAILFLPMSAKS 146
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 161 GPRTHYGOKAILFLPLVSS 180

RESULT 12
ENTRY    A32398 #type complete
TITLE    basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS  basic fibroblast growth factor, 18K form
ORGANISM  #formal_name Homo sapiens #common_name man
DATE      31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
#cross-references MUID:89184522
#accession  A32398
#molecule_type mRNA
#residues   1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE A61537
#authors   Shibata, F.; Baird, A.; Florkiewicz, R.2.
#journal    Growth Factors (1991) 4:277-287
#title      Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession  A61537
#molecule_type DNA
#residues   1-114 #label SH1
#note      authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE A26642
#authors   Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal    FEBS Lett. (1987) 213:189-194
#title      Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession  A26642
#molecule_type mRNA
#residues   56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE A30924
#authors   Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal    Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title      Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession  B32878
#molecule_type mRNA
#residues   56-210 #label ABR
#note      the authors translated the codon GAA for residue 108 as
Gly
REFERENCE S00297
#authors   Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal    EMBO J. (1986) 5:2523-2528
#title      Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession  S00297
#status     not compared with conceptual translation
#molecule_type DNA
#residues   1-155 #label AB2
#note      the authors translated the codon GAA for residue 108 as
Gly
REFERENCE A54316
#authors   Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal    Jpn. J. Cancer Res. (1991) 82:1263-1270
#title      Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession  A54316
#molecule_type protein
#residues   'XX',86-88,'X',90-91,'X',93-95 #label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note      sequence extracted from NCBI backbone (NCBIP:71595)
#accession  B54316
#molecule_type protein
#residues   'XXX',19,'X',21-29 #label SH2
#note      sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors   Felge, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
L.C.; Barr, P.J.; Baird, A.
#journal    J. Cell Biol. (1989) 109:3105-3114
#title      Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession  A33624
#status     preliminary
#molecule_type protein
#residues   57-210 #label FEI
REFERENCE A25824
#authors   Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal    Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title      Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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[illegible]

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#cross-references MUID:87156686
#accession A25824
##molecule_type protein
##residues 57-77 ##label STO
##experimental_source prostate
REFERENCE
A90122
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities
#cross-references MUID:86186784
#accession B24243
##molecule_type protein
##residues 65-102,'X',104-105 #label GIM
##experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession B24301
##molecule_type protein
##residues 65-88,'X',90-98,'X',100 #label GAU
#reference S42242
Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
Biochem. Biophys. Res. Commun. (1987) 144:543-550
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession S42242
##status preliminary
##molecule_type mRNA
##residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087
REFERENCE
A55784
Pantolianno, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession B55784
##molecule_type protein
##residues 54-71 #label PAN
REFERENCE
I52267
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
Reverse transcription with nested polymerase chain reaction
shows expression of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
##status preliminary; translated from GB/EMBL/DDBJ
##molecule_type mRNA
##residues 95-182 #label RES
#cross-references GB:S47380; NID:g256535
##experimental_source granulosa cells
REFERENCE
S46253
Patry, V.; Bugler, B.; Amalric, F.; Promé, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639
```

[W][A][T][E][R][M][A][N]
[P][R][O][T][E][I][N]
[S][E][Q][U][E][N][C][E]
[I][N][F][O][R][M][A][T][I][O][N]
[T][E][M][P][L][A][T][E]
[T][M]

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MPsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:45:20 2000; MasPar time 7.94 Seconds
706.264 Million cell updates/sec
Regular output not generated.

Title: >US-09-121-017B-5
Description: (1-181) from US09121017B.pep
Perfect Score: 1300
Sequence: 1 MSGAGRVQGTQLQALVELGV.....PRTHYGKAILFLPLPVSSD 181

Scoring table: PAM 150
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%
Listing first 45 summaries

Database: swiss-prot38-----
-I:Swissprot

Statistics: Mean 44.306; Variance 68.544; scale 0.646

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	920	70.8	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 2.55e-206
2	903	69.5	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 9.03e-202
3	900	69.2	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 5.73e-201
4	899	68.4	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH 5.00e-198
5	851	65.5	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 6.96e-188
6	850	65.4	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 1.29e-187
7	464	35.7	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 1.67e-86
8	458	35.2	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 5.62e-85
9	453	34.8	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 1.05e-83
10	451	34.7	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 3.40e-83
11	449	34.5	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 1.09e-82
12	445	34.2	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 1.14e-81
13	439	33.8	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 3.78e-80
14	427	32.8	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 4.12e-77
15	407	31.3	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 4.52e-72
16	315	24.2	209	1	FGF3_XENLA	GLIA-ACTIVATING FACTOR 2.64e-49
17	305	23.5	208	1	FGF3_RAT	GLIA-ACTIVATING FACTOR 6.97e-47
18	305	23.5	208	1	FGF3_HUMAN	GLIA-ACTIVATING FACTOR 6.97e-47
19	305	23.5	208	1	FGF3_MOUSE	GLIA-ACTIVATING FACTOR 6.97e-47
20	285	21.9	207	1	FGF3_HUMAN	FIBROBLAST GROWTH FACT 4.45e-42
21	280	21.5	207	1	FGF3_RAT	FIBROBLAST GROWTH FACT 6.94e-41
22	275	21.2	208	1	FGF3_MOUSE	FIBROBLAST GROWTH FACT 1.07e-39
23	262	20.2	220	1	FGF3_CHICK	FIBROBLAST GROWTH FACT 1.26e-36

24	248	19.1	237	1	FGF3_XENLA	FIBROBLAST GROWTH FACT 2.39e-33
25	243	18.7	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA 3.46e-32
26	243	18.7	208	1	FGF6_HUMAN	FIBROBLAST GROWTH FACT 3.46e-32
27	242	18.6	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT 5.89e-32
28	242	18.6	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT 5.89e-32
29	240	18.5	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA 1.71e-31
30	241	18.5	225	1	FGF3_HUMAN	FIBROBLAST GROWTH FACT 1.00e-31
31	240	18.5	239	1	FGF3_HUMAN	INT-2 PROTO-ONCOGENE P 1.71e-31
32	240	18.5	247	1	FGFE_MOUSE	FIBROBLAST GROWTH FACT 2.91e-31
33	239	18.4	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT 2.91e-31
34	239	18.4	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 2.91e-31
35	239	18.4	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT 2.91e-31
36	238	18.3	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT 4.95e-31
37	238	18.3	245	1	FGF3_MOUSE	INT-2 PROTO-ONCOGENE P 4.95e-31
38	236	18.2	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA 1.43e-30
39	235	18.1	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT 2.43e-30
40	235	18.1	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT 2.43e-30
41	234	18.0	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT 4.13e-30
42	226	17.4	243	1	FGFC_HUMAN	FIBROBLAST GROWTH FACT 2.80e-28
43	225	17.3	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT 4.73e-28
44	225	17.3	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT 4.73e-28
45	224	17.2	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT 7.99e-28

ALIGNMENTS

RESULT 1
ID FGF1_HUMAN STANDARD; PRT; 155 AA.
AC P05230; P07502;
DT 13-AUG-1987 (Rel. 05, Created)
DT 13-AUG-1987 (Rel. 05, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST-
DE GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-
DE BETA).
GN FGF1 OR FGFA.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 86261805.
RA Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Raverz M.W.,
RA O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;
RT "Human endothelial cell growth factor: cloning, nucleotide sequence,
RT and chromosome localization.";
RL Science 233:541-545(1986).
RN [2]
RP SEQUENCE FROM N.A.
RC TISSUE-BRAIN STEM;
RX MEDLINE; 89343957.
RA Wang W.P., Lehtoma K., Varban M.L., Krishnan L., Chiu I.M.;
RT "Cloning of the gene coding for human class I heparin-binding growth
factor and its expression in fetal tissues.";
RL Mol. Cell. Biol. 9:2387-2395(1989).
RN [3]
RP SEQUENCE FROM N.A.
RC TISSUE-BRAIN STEM;
RX MEDLINE; 90265618.
RA Chiu I.M., Wang W.P., Lehtoma K.;
RT "Alternative splicing generates two forms of mRNA codin; for human
RT heparin-binding growth factor 1.";
RL Oncogene 5:755-762(1990).
RN [4]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90073637.
RA Merqia A., Tischer E., Graves D., Tumolo A., Miller J.,
RA Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes I.C.;
RT "Structural analysis of the gene for human acidic fibroblast growth
RT factor.";
RL Biochem. Biophys. Res. Commun. 164:1121-1129(1989).
RN [5]
RP SEQUENCE FROM N.A.

RX MEDLINE; 92019819.
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;
RT "Cloning and sequence analysis of the human acidic fibroblast growth
RL factor gene and its preservation in leukemia patients.";
RN Oncogene 6:1521-1529(1991).
[6]
RX SEQUENCE FROM N.A.
RP MEDLINE; 92202857.
RA Li Y.L., Kha H., Golden J.A., Migchelsen A.A.J., Goetzl E.J.,
RA Turck E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist.";
RL J. Exp. Med. 175:1073-1080(1992).
[7]
RX SEQUENCE OF 1-154 FROM N.A.
RP MEDLINE; 94069734.
RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
[8]
RX SEQUENCE OF 1-40 FROM N.A.
RP MEDLINE; 90365758.
RA Crumley G., Dionne C.A., Jaye M.;
RT "The gene for human acidic fibroblast growth factor encodes two
RT upstream exons alternatively spliced to the first coding exon.";
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).
[9]
RX SEQUENCE OF 16-155.
RP MEDLINE; 86296647.
RA Harper J.W., Strydom D.J., Lobb R.R.;
RT "Human class I heparin-binding growth factor: structure and homology
RT to bovine acidic brain fibroblast growth factor.";
RL Biochemistry 25:4097-4103(1986).
[10]
RX SEQUENCE OF 16-155.
RP MEDLINE; 86295741.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "The complete amino acid sequence of human brain-derived acidic
RT fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).
[11]
RX SEQUENCE OF 16-155.
RP MEDLINE; 87048871.
RA Gautschi-Sova P., Mueller T., Boehlen P.;
RT "Amino acid sequence of human acidic fibroblast growth factor.";
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).
[12]
RX SEQUENCE OF 16-47.
RP MEDLINE; 86186784.
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
RT "Human brain-derived acidic and basic fibroblast growth factors:
RT amino terminal sequences and specific mitogenic activities.";
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
[13]
RX SEQUENCE OF 16-49.
RP MEDLINE; 86275260.
RA Gautschi P., Frater-Schroeder M., Boehlen P.;
RT "Partial molecular characterization of endothelial cell mitogens from
RT human brain: acidic and basic fibroblast growth factors.";
RL FEBS Lett. 204:203-207(1986).
[14]
RX X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
RP MEDLINE; 96194129.
RA Blaber M., Disalvo J., Thomas K.A.;
RT "X-ray crystal structure of human acidic fibroblast growth factor.";
RL Biochemistry 35:2086-2094(1996).
[15]
RX STRUCTURE BY NMR OF 24-155.
RP MEDLINE; 94358885.
RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,
RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast
RT growth factor activated by inositol hexasulfate.";
RL J. Mol. Biol. 242:81-98(1994).
[16]
RX STRUCTURE BY NMR OF 24-155.
RP MEDLINE; 97107535.
RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,
RA Rico M., Gimenez-Gallego G.;
RT "Three-dimensional structure of acidic fibroblast growth factor in
RT solution: effects of binding to a heparin functional analog.";
RL J. Mol. Biol. 264:162-178(1996).
[17]
RX STRUCTURE BY NMR OF 25-155.
RP MEDLINE; 98387896.
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,
RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral
RT action of suramin and suradistas.";
RL J. Mol. Biol. 281:899-915(1998).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES bFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; M1361; AAA79245.1;
CC EMBL; X51943; CAA36206.1;
CC EMBL; M30492; AAA52446.1;
CC EMBL; M30490; AAA52446.1; JOINED.
CC EMBL; M30491; AAA52446.1; JOINED.
CC EMBL; M60515; AAA51672.1;
CC EMBL; M60516; AAA51673.1;
CC EMBL; M23087; AAA52638.1;
CC EMBL; M23086; AAA52638.1; JOINED.
CC EMBL; S67291; AAB29057.1;
CC EMBL; X65778; CAA46661.1;
CC PIR; A23553; A23553.
CC PIR; A24243; A24243.
CC PIR; A24301; A24301.
CC PIR; A24662; A24662.
CC PIR; A24820; A24820.
CC PIR; A26386; A26386.
CC PIR; A33665; A33665.
CC PIR; S18217; S18217.
CC PDB; 2AFG; 15-OCT-95.
CC PDB; 1AXM; 22-APR-98.
CC PDB; 2AXM; 22-APR-98.
CC PDB; 1RML; 11-NOV-98.
CC MIM; 131220;
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGF.FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
KW 3D-structure.
FT PROPEP 1 15 HEPARIN-BINDING GROWTH FACTOR 1.
FT CHAIN 16 155 ACETYLATION
FT MOD_RES 2 2 HEPARIN (POTENTIAL).
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
FT SEQUENCE 155-AA; 17460 MW; F586E8BFB09F1580 CRC64;

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Query Match      70.8%; Score 920; DB 1; Length 155;
Best Local Similarity 93.8%; Pred. No. 2.55e-206;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 18 LPPGNYKPKLLYCSNGHFLRILPDGTVDRSDQHIQLQLSAESGVEYIKSTGTG 77
   | : ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Qy 38 LDANKPKPKLLYCSNGHFLRILPDGTVDRSDQHIQLQLSAESGVEYIKSTGTG 97
   | : ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Db 78 QYLANDTDGLLYGSGTPNEECFLERLEP-----NHYNTYISKHAENWVGLKKNKS 131
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Qy 98 QYLANDTDGLLYGSGTPNEECFLERLEPAAATPAPNHYNTYISKHAENWVGLKKNKS 157
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Db 132 CKRGPRTHYGKAILFLPLPVSSD 155
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Qy 158 CKRGPRTHYGKAILFLPLPVSSD 181
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||

RESULT 2
ID  FG1L_MESAU  STANDARD;  PRT;  155 AA.
AC  P34004;
DT  01-FEB-1994 (Rel. 28, Created)
DE  01-FEB-1994 (Rel. 28, Last sequence update)
DE  15-JUL-1999 (Rel. 38, Last annotation update)
DE  HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE  GROWTH FACTOR) (AFGF).
GN  FGF1 OR FGF-1.
OS  Mesocricetus auratus (Golden hamster).
OC  Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC  Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;
OC  Mesocricetus.
RN  [1]
RP  SEQUENCE FROM N.A.
RX  MEDLINE; 90270291.
RA  Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;
RT  "Characterization of the hamster DDT-1 cell aFGF/HBGF-1 gene and cDNA
RT  and its modulation by steroids.";
RL  J. Cell. Biochem. 43:17-26(1990).
CC  -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC  IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC  VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC  CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC  -!- SUBUNIT: MONOMER.
CC  -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC  THAN DOES BFGF.
CC  -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
DR  PIR; A60721; A60721.
DR  HSSP; P05230; 2AXM.
DR  PFAM; PF00167; FGF; 1.
DR  PROSITE; PS00247; HBGF_FGF; 1.
KW  Growth factor; Mitogen; Vascularization; Heparin-binding.
FT  PROPEP 1 15
   BY SIMILARITY.
FT  CHAIN 16 155
   HEPARIN-BINDING GROWTH FACTOR 1.
FT  BINDING 24 28
   HEPARIN (POTENTIAL).
FT  BINDING 113 116
   HEPARIN (POTENTIAL).
SQ  SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

Query Match      69.5%; Score 903; DB 1; Length 155;
Best Local Similarity 91.7%; Pred. No. 9.03e-202;
Matches 132; Conservative 2; Mismatches 4; Indels 6; Gaps 1;

Db 18 LPPGNYKPKLLYCSNGHFLRILPDGTVDRSDQHIQLQLSAESGVEYIKSTGTG 77
   | : ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Qy 38 LDANKPKPKLLYCSNGHFLRILPDGTVDRSDQHIQLQLSAESGVEYIKSTGTG 97
   | : ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Db 78 QYLANDTDGLLYGSGTPNEECFLERLEP-----NHYNTYISKHAENWVGLKKNKS 131
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Qy 98 QYLANDTDGLLYGSGTPNEECFLERLEPAAATPAPNHYNTYISKHAENWVGLKKNKS 157
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Db 132 CKRGPRTHYGKAILFLPLPVSSD 155
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
Qy 158 CKRGPRTHYGKAILFLPLPVSSD 181
   ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||

RESULT 3
ID  FG1L_MOUSE  STANDARD;  PRT;  155 AA.
AC  P10935;
DT  01-JUL-1989 (Rel. 11, Created)
DT  01-JUL-1989 (Rel. 11, Last sequence update)
DT  15-JUL-1999 (Rel. 38, Last annotation update)
DE  HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE  GROWTH FACTOR) (AFGF).
GN  FGF1 OR FGF-1 OR FGFA.
OS  Mus musculus (Mouse); and Rattus norvegicus (Rat).
OC  Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC  Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN  [1]
RP  SEQUENCE FROM N.A.
RX  SPECIES=RAT.
RX  MEDLINE; 89240051.
RA  Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
RT  "The nucleotide sequence of rat heparin binding growth factor 1
RT  (HBGF-1).";
RL  Nucleic Acids Res. 17:2867-2867(1989).
RN  [2]
RP  SEQUENCE FROM N.A.
RX  SPECIES=MOUSE;
RX  MEDLINE; 90201563.
RA  Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RT  "Isolation of cDNAs encoding four mouse FGF family members and
RT  characterization of their expression patterns during embryogenesis.";
RL  Dev. Biol. 138:454-463(1990).
RN  [3]
RP  SEQUENCE FROM N.A.
RX  SPECIES=MOUSE;
RX  MEDLINE; 97128312.
RA  Madial F., Hackshaw K.V., Chiu I.M.;
RT  "Cloning and characterization of the mouse Fgf-1 gene.";
RL  Gene 179:231-236(1996).
RN  [4]
RP  SEQUENCE FROM N.A.
RX  SPECIES=MOUSE; STRAIN=BALB/C;
RX  MEDLINE; 97094746.
RA  Alam K.Y., Frotschalm A., Hackshaw K.V., Evans J.E., Rotter A.,
RA  Chiu I.M.;
RT  "Characterization of the 1B promoter of fibroblast growth factor 1
RT  and its expression in the adult and developing mouse brain.";
RL  J. Biol. Chem. 271:30263-30271(1996).
CC  -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC  IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC  VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC  CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC  -!- SUBUNIT: MONOMER.
CC  -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC  entities requires a license agreement (see http://www.isb.ch/announce/
CC  or send an email to license@isb-sib.ch).
DR  EMBL; X14232; CAA32448.1; -
DR  EMBL; M30641; AAA37618.1; -
DR  EMBL; U36459; AAC52969.1; -
DR  EMBL; U36457; AAC52969.1; JOINED.
DR  EMBL; U36458; AAC52969.1; JOINED.
DR  EMBL; U67610; AAC52907.1; -
DR  PIR; S04147; S04147.
DR  PIR; D37360; D37360.
DR  HSSP; P05230; 2AXM.
DR  MGD; MGI:95515; FGF1.
DR  PFAM; PF00167; FGF; 1.
DR  PRINTS; PR00262; IL1HBGF.

```


DR PRINTS: PR00263; HBGFPGF.
DR PROSITE: PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;

Query Match 69.2%; Score 900; DB 1; Length 155;
Best Local Similarity 92.2%; Pred. No. 5.73e-201;
Matches 130; Conservative 3; Mismatches 2; Indels 6; Gaps 1;

Db 21 GNKKPKLLYCSNGHFLRLPDGTVDGTRSDQHIQQLSLSAESVGVYKSTETG 80
QY 41 ANYKKPKLLYCSNGHFLRLPDGTVDGTRSDQHIQQLSLSAESVGVYKSTETG 100
Db 81 AMTEGLLYSGTTPNEECFLERLEE-----NHYNTYTSKKHAENWFWGLKNGSKR 134
101 AMTDGLLYSGTTPNEECFLERLEEATPAPNHYNTYTSKKHAENWFWGLKNGSKR 160
135 GPRTHYQKAILFLPLPVSSD 155
QY 161 GPRTHYQKAILFLPLPVSSD 181

RESULT 4
ID FGF1_PIG STANDARD; PRT; 152 AA.
AC P20002;
DT 01-FEB-1991 (Rel. 17, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR) (FRAGMENT).
DE FGF1 OR FGF-1.
OS Sus scrofa (Pig).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=HEART;
RX MEDLINE; 92062117.
RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;
RT "Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart."
RL Biochem. Biophys. Res. Commun. 180:853-859(1991).
[2]
RN SEQUENCE OF 22-41.
RC MEDLINE; 89231704.
RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,
RA Sharma H.S., Schaper W.;
RT "Isolation of heparin-binding growth factors from bovine, porcine and canine hearts."
RL Eur. J. Biochem. 181:67-73(1989).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
CC EMBL; X60317; CAA42869.1; -.

DR PIR: S03954; S03954.
DR HSP: P05230; 2AXM.
DR PFAM: PF00167; FGF; 1.
DR PROSITE: PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.
FT BINDING 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.
FT BINDING 24 28 HEPARIN (POTENTIAL).
FT BINDING 113 116 HEPARIN (POTENTIAL).
FT CONFLICT 31 31 C -> S (IN REF. 2).
FT CONFLICT 39 39 R -> Y (IN REF. 2).
FT NON_TER 152 152
SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 68.4%; Score 889; DB 1; Length 152;
Best Local Similarity 91.5%; Pred. No. 5.00e-198;
Matches 129; Conservative 2; Mismatches 4; Indels 6; Gaps 1;

Db 18 LPPGNKKPKLLYCSNGHFLRLPDGTVDGTRSDQHIQQLSLSAESVGVYKSTETG 77
QY 38 LDANYKKPKLLYCSNGHFLRLPDGTVDGTRSDQHIQQLSLSAESVGVYKSTETG 97
Db 78 QYLANDTGLLYSGTTPNEECFLERLEE-----NHYNTYTSKKHAENWFWGLKNGS 131
QY 98 QYLANDTGLLYSGTTPNEECFLERLEEATPAPNHYNTYTSKKHAENWFWGLKNGS 157
132 CKRGPRTHYQKAILFLPLPV 152
QY 158 CKRGPRTHYQKAILFLPLPV 178

RESULT 5
ID FGF1_BOVIN STANDARD; PRT; 155 AA.
AC P03968;
DT 23-OCT-1986 (Rel. 02, Created)
DT 01-MAR-1989 (Rel. 10, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF II).
DE FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Bovinae; Bos.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89083506.
RA Halley C., Courtols Y., Laurent M.;
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA."
RL Nucleic Acids Res. 16:10913-10913(1988).
[2]
RN SEQUENCE FROM N.A.
RC TISSUE=RETINA;
RX MEDLINE; 89078619.
RA Alterio J., Halley C., Brou C., Soussi T., Courtols Y., Laurent M.;
RT "Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina."
RL FEBS Lett. 242:41-46(1988).
[3]
RN SEQUENCE OF 2-155.
RX MEDLINE; 87016918.
RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
RT "Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor."
RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
[4]
RN SEQUENCE OF 2-155.
RX MEDLINE; 87026586.

QY 146 KNFVGLKNGSKRGPRTHYGQKAILFLPLVSS 180
 :||:||||:| | ||:| |||||:| |

RESULT 9
 ID FGF2_SHEEP STANDARD; PRT; 155 AA.
 AC P20003;
 DT 01-FEB-1991 (Rel. 17, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-FEB-1996 (Rel. 33, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2 OR FGF-2.
 OS Ovis aries (Sheep).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
 OC Bovidae; Caprinae; Ovis.
 RN [1]
 SEQUENCE FROM N.A.
 Suttou R., Ward W.G., Raphael K.A., Cam G.R.;
 Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.
 [2]
 RP SEQUENCE OF 9-155.
 RX MEDLINE; 88055577.
 RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.,
 Rubira M.R., Burgess A.W.;
 RT "Primary structure of ovine pituitary basic fibroblast growth
 factor.";
 RL FEBS Lett. 224:128-132(1987).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
 CC AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC PIR; S00185; S00185.
 CC HSP; P09038; 1BFF.
 CC PFAM; PF00167; FGF; 1.
 CC PRINTS; PR00262; IILHBGF.
 CC PRINTS; PR00263; HBGF.FGF.
 CC DR PROSITE; PS00247; HBGF_FGF; 1.
 CC KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 CC FT PROPEP 1 9
 CC FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
 CC FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).
 CC FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).
 CC FT BINDING 27 31 HEPARIN (POTENTIAL).
 CC FT BINDING 116 119 HEPARIN (POTENTIAL).
 CC SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;
 Query Match 34.8%; Score 453; DB 1; Length 155;
 Best Local Similarity 52.9%; Pred. No. 1.05e-83;
 Matches 74; Conservative 23; Mismatches 35; Indels 8; Gaps 3;
 Db 24 GHFKPKRKYNGGFFRIHPDGRVDGVRKSPHKLQQAERGVSIGVCANRYL 83
 QY 41 ANYKPKLLKCSNGGHHFRIIPDGTVDTRDSQHQLOQLQSAESVGEVIKSTETQYL 100
 Db 84 AMKEDGRLLASKCVTDECFERLE-----S--NNYNTYRSKYS--SWYVALKRTGYKL 135
 QY 101 AMDTDGLLYGSQTPNECLFLERLEAATPAPNHYNTYISKHAENKWFVGLKNGSKCR 160

Db 136 GPKTGPCQKAILFLPLMSAKS 155
 QY 161 GPRTHYGQKAILFLPLVSS 180
 :||:||||:| | ||:| |||||:| |
 RESULT 10
 ID FGF2_HUMAN STANDARD; PRT; 155 AA.
 AC P09038;
 DT 01-NOV-1988 (Rel. 09, Created)
 DT 01-NOV-1988 (Rel. 09, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2 OR FGF.
 OS Homo sapiens (Human).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
 RN [1]
 SEQUENCE FROM N.A.
 MEDLINE; 87053817.
 RX Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,
 RA Gospodarowicz D., Fiddes J.C.;
 RT "Human basic fibroblast growth factor: nucleotide sequence and
 RT genomic organization.";
 RL EMBO J. 5:2523-2528(1986).
 RN [2]
 SEQUENCE FROM N.A.
 RX MEDLINE; 87217066.
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
 RT "Human basic fibroblast growth factor: nucleotide sequence, genomic
 RT organization, and expression in mammalian cells.";
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
 RN [3]
 SEQUENCE FROM N.A.
 RX MEDLINE; 87213238.
 RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,
 RA Rifkin D.B.;
 RT "A form of human basic fibroblast growth factor with an extended
 RT amino terminus.";
 RL Biochem. Biophys. Res. Commun. 144:543-550(1987).
 RN [4]
 SEQUENCE FROM N.A.
 RX MEDLINE; 87162468.
 RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;
 RT "Cloning and expression of cDNA encoding human basic fibroblast
 RT growth factor.";
 RL FEBS Lett. 213:189-194(1987).
 RN [5]
 SEQUENCE FROM N.A.
 RX MEDLINE; 89184522.
 RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,
 RA Liauzun P., Chalou P., Tauber J.P., Anallric F., Smith J.A.,
 RA Caput D.;
 RT "High molecular mass forms of basic fibroblast growth factor are
 RT initiated by alternative CUG codons.";
 RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
 RN [6]
 SEQUENCE OF 10-35.
 RX MEDLINE; 86275260.
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;
 RT "Partial molecular characterization of endothelial cell mitogens from
 RT human brain: acidic and basic fibroblast growth factors.";
 RL FEBS Lett. 204:203-207(1986).
 RN [7]
 SEQUENCE OF 10-39.
 RX MEDLINE; 86186784.
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;
 RT "Human brain-derived acidic and basic fibroblast growth factors:
 RT amino terminal sequences and specific mitogenic activities.";
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).
 RN [8]
 SEQUENCE OF 2-22.

DR	PIR:	A25824;	A25824.
DR	PIR:	A26642;	A26642.
DR	PIR:	B24243;	B24243.
DR	PIR:	B24301;	B24301.
DR	PIR:	B32878;	B32878.
DR	PIR:	S00297;	S00297.
DR	PDB:	ZFGF; 15-APR-92.	
DR	PDB:	ZFGF; 15-JUL-93.	
DR	PDB:	ZFGA; 15-JUL-93.	
DR	PDB:	ZBFB; 03-APR-96.	
DR	PDB:	ZBFC; 03-APR-96.	
DR	PDB:	ZBFF; 16-JUN-97.	
DR	PDB:	ZBFG; 31-JAN-94.	
DR	PDB:	ZBFH; 30-APR-94.	
DR	PDB:	ZBLA; 08-NOV-96.	
DR	PDB:	ZBLD; 08-NOV-96.	
DR	MIM:	I34920;	
DR	PFAM:	PF00167; FGF; 1.	
DR	PRINTS:	PRO0262; ILIHGFG.	
DR	PRINTS:	PRO0263; HEGFFGG.	
DR	PROSITE:	PS00247; HBGF_FGF; 1.	
KW	Growth factor:	Mitogen; Vascularization; Heparin-binding;	
KW	3D-structure.		
FT	PROPEP	1	9
FT	CHAIN	10	155
FT	SITE	46	48
FT	SITE	88	90
FT	BINDING	27	31
FT	BINDING	116	119
FT	STRAND	30	34
FT	TURN	35	38
FT	STRAND	39	43
FT	TURN	45	46
FT	STRAND	49	52
FT	TURN	55	56
FT	HELIX	58	60
FT	STRAND	62	66
FT	TURN	69	70
FT	STRAND	71	76
FT	TURN	77	80
FT	STRAND	81	85
FT	TURN	87	88
FT	STRAND	91	94
FT	HELIX	99	101
FT	STRAND	103	107
FT	TURN	109	110
FT	STRAND	113	117
FT	TURN	121	122
FT	STRAND	124	124
FT	STRAND	127	127
FT	TURN	129	130
FT	STRAND	132	133
FT	HELIX	136	138
FT	TURN	141	142
FT	HELIX	144	146
FT	STRAND	148	152
SEQ	SEQUENCE	155 AA;	17254 MW; BE6CE13373007129 CRC64;
Query Match 34.7%; Score 451; DB 1; Length 155;			
Best Local Similarity 48.4%; Pred. NO. 3.40e-83;			
Matches 75; Conservative 30; Mismatches 42; Indels 8; Gaps			
Db	9	LPALPDGCGCAFPFGPHFKDPKLYCKNGGFFLRHPDGVRDVGREKSDPHIKLQAE 68	
	:	: : : : : :	
QY	26	VESPAGARAQGTLLDANYKKPKLLYSNGGHFLRLIPDGTVDGRDSOHJQLSAES 85	
	:	: : : : : :	
Db	69	RGVWSIKGCVANRYLAMKEDGRLLASKCVTDECFFERLE-----S-NNYNTYRSKYT- 121	
	:	: : : : : :	
QY	86	VEGVTKETGTQGLAMDTDGLLYGSQTNEECFLERLEEAAATPAPHNWTIISKRAE 145	
	:	: : : : : :	
Db	122	-SWYVALKRTGOYLKSGSKTGPGOKAILFLPMSAKS 155	
OY	146	KWRFYGLKNSSCRGPETHYGOKAIFLPLPVSS 180	
	:	: : : : : :	

RESULT 11
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 13-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
[1]
RN SEQUENCE FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;
RX MEDLINE; 89061721.
RA Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
Cooksey K., Baird A., Ling N.;
"Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of its mRNA.";
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).
[2]
RN SEQUENCE FROM N.A.
RC TISSUE-BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
"Nucleotide sequence of rat basic fibroblast growth factor cDNA";
RL Nucleic Acids Res. 16:5201-5201(1988).
[3]
RN SEQUENCE OF 1-28 FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
"Cloning of the rat fibroblast growth factor-2 promoter region and
its response to mitogenic stimuli in glioma C6 cells.";
RL J. Neurochem. 68:898-908(1997).
[4]
RN SEQUENCE OF 35-154 FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
"PCR detection of the rat brain basic fibroblast growth factor (bFGF)
mRNA containing a unique 3' untranslated region.";
RL Biochim. Biophys. Acta 1131:314-316(1992).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876
CC PIR; A31674; A31674.
CC HSPF; P09038; IBBF.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; ILIHGF.

FT BINDING 26 30 HEPARIN (POTENTIAL).
 FT BINDING 115 118 HEPARIN (POTENTIAL).
 SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;
 Query Match 34.2%; Score 445; DB 1; Length 154;
 Best Local Similarity 52.1%; Pred. No. 1.14e-81;
 Matches 73; Conservative 24; Mismatches 35; Indels 8; Gaps 3;
 Db 23 GHFKDPKRLKCKNGGFFLRHPDGRVGVREKSDPHVQLQLOAERGVSIVKVCANRYL 82
 QY 41 ANYKPKLLYCSNGGHFLRLPDGVDTDRSDQHIOQLSAESVGEVYIKSTETGYL 100
 Db 83 AWKEDGRLLAKCVTECEFFERLE-----S--NNYTYRSKYS--SWYALKRTGYKL 134
 QY 101 AMDTDGLLYGSGTPNEECLEFLERLEEAATPAPNHYNTYISKHAEKNWVGLKNGSCKR 160
 Db 135 GSKTGPQKAILFLPMSAKS 154
 QY 161 GPRHYGOKAILFLPVS 180
 RESULT 13
 ID FGF2_MONDO STANDARD; PRT; 156 AA.
 AC P48798;
 DT 01-FEB-1996 (Rel. 33, Created)
 DT 01-FEB-1996 (Rel. 33, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).
 GN FGF2.
 OS Monodelphis domestica (Short-tailed grey opossum).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX TISSUE-EYE;
 RX MEDLINE; 94296558.
 RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;
 RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica";
 RL DNA Cell Biol. 13:549-554(1994).
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
 CC -!- SUBUNIT: MONOMER.
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 DR EMBL; Z15154; CRA78854.1; ALT_INIT.
 DR HSP; P09038; IBFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00263; ILIHGFG.
 DR PRINTS; PR00263; HBGFFGF.
 DR PROSITE; PS00247; HBGFFGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 FT CHAIN 10 156
 FT BINDING 28 32 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 117 120 HEPARIN (POTENTIAL).
 SQ SEQUENCE 156 AA; 17303 MW; 7E659FCC49BF1209 CRC64;
 Query Match 33.8%; Score 439; DB 1; Length 156;
 Best Local Similarity 51.0%; Pred. No. 3.78e-80;

Matches 74; Conservative 25; Mismatches 38; Indels 8; Gaps 3;
 Db 20 GAFFPGHFKOPKRLKCKNGGFFLRHPDGRVGVREKSDPHVQLQLOAERGVSIVKVC 79
 QY 36 GTLDANIKPKLLYCSNGGHFLRLPDGVDTDRSDQHIOQLSAESVGEVYIKSTE 95
 Db 80 ANYLANKEDGRLLAKVYVECEFFERLE-----S--NNYTYRSKYS--NWYALKRT 131
 QY 96 TGOYLDMDTGLLYGSGTPNEECLEFLERLEEAATPAPNHYNTYISKHAEKNWVGLKKN 155
 Db 132 GOYKLGSKTGPQKAILFLPMSAKS 156
 QY 156 GSKRGPRHYGOKAILFLPVS 180
 RESULT 14
 ID FGF2_XENLA STANDARD; PRT; 155 AA.
 AC P12226;
 DT 01-OCT-1989 (Rel. 12, Created)
 DT 01-JAN-1990 (Rel. 13, Last sequence update)
 DT 01-NOV-1997 (Rel. 35, Last annotation update)
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).
 GN FGF2 OR FGF-2.
 OS Xenopus laevis (African clawed frog).
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae;
 OC Xenopodinae; Xenopus.
 RN [1]
 RP SEQUENCE FROM N.A.
 RX MEDLINE; 89058621.
 RA Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;
 RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer";
 RL Science 242:1053-1056(1988).
 RN [2]
 RP SEQUENCE OF 95-155 FROM N.A.
 RX MEDLINE; 88052890.
 RA Kimelman D., Kirschner M.;
 RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early Xenopus embryo";
 RL Cell 51:869-877(1987).
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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 CC -----
 DR EMBL; M18067; AAA49726.1;
 DR PIR; A29618; A29618.
 DR PIR; A40117; A40117.
 DR HSP; P09038; IBFF.
 DR PFAM; PF00167; FGF; 1.
 DR PRINTS; PR00262; ILIHGFG.
 DR PRINTS; PR00263; HBGFFGF.
 DR PROSITE; PS00247; HBGFFGF; 1.
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.
 FT PROPEP 1 9
 FT CHAIN 10 155
 FT BINDING 27 31 HEPARIN-BINDING GROWTH FACTOR 2.
 FT BINDING 116 119 HEPARIN (POTENTIAL).
 FT CONFLICT 111 111 MISSING (IN REF. 2).
 SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;
 Query Match 32.8%; Score 427; DB 1; Length 155;
 Best Local Similarity 51.4%; Pred. No. 4.12e-77;
 Matches 72; Conservative 24; Mismatches 36; Indels 8; Gaps 3;

(TM)

Result No.	Score	Query		DB	ID	Description	Pred. No.
		Match	Length				
1	451	34.7	196	4	P78443	21 KD BASIC FIBROBLAST	1.10e-79
2	448	34.5	130	6	O77767	BASIC FIBROBLAST GROWTH	5.93e-79
3	319	24.5	101	13	P79706	BASIC FGF (FRAGMENT)	3.82e-48
4	283	21.8	146	13	Q07659	FIBROBLAST GROWTH FACT	8.07e-40
5	266	20.5	59	4	Q16089	ACIDIC FIBROBLAST GROW	6.01e-36
6	267	20.5	60	4	Q16588	ACIDIC FIBROBLAST GROW	3.57e-36
7	264	20.3	70	11	O4837	FIBROBLAST GROWTH FACT	1.70e-35
8	258	19.8	212	13	O42407	FIBROBLAST GROWTH FACT	3.85e-34
9	250	19.2	115	11	Q60487	BASIC FIBROBLAST GROWT	2.41e-32
10	242	18.6	194	6	P79150	KERATINOCYTE GROWTH FA	1.47e-30
11	240	18.5	252	11	O89096	FHF-4B	4.09e-30
12	227	17.5	243	13	Q9W6A1	FIBROBLAST GROWTH FACT	3.03e-27
13	223	17.2	192	4	Q95830	FIBROBLAST GROWTH FACT	2.28e-26
14	223	17.2	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	2.28e-26
15	222	17.1	127	4	Q95917	FIBROBLAST GROWTH FACT	3.77e-26
16	208	16.0	206	13	Q9YGD8	FIBROBLAST GROWTH FACT	4.09e-23
17	206	15.8	196	13	Q9YH31	POTATIVE FIBROBLAST GR	1.10e-22
18	186	14.3	114	4	O00527	BASIC FIBROBLAST GROWT	1.90e-18
19	186	14.3	114	4	Q16443	BASIC FIBROBLAST GROWT	1.90e-18
20	178	13.7	174	6	O77561	KERATINOCYTE GROWTH FA	8.69e-17

[1]
RN
RP SEQUENCE FROM N.A.
RC TISSUE=EMBRYO;
RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
RT KANEIDA T.;
RR "Serial expression of the genes in a mesodermalizing ectoderms of
RT early Cynops gastrula.";
RL Submitted (NOV-1996) to the EMBL/GenBank/DDJ databases.
DR EMBL; D89443; BAA13958.1; -.
DR HSSP; P09038; 2BFH.
DR PROSITE; PS00247; HBGF_FGF; 1.

OC Eukaryota: Metazoa: Chordata: Craniata: Vertebrata: Mammalia:

[illegible]

RESULT 11
ID O89096 PRELIMINARY; PRT; 252 AA.
AC O89096:

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Query Match          17.5%  Score 227;  DB 13;  Length 243;
Best Local Similarity 30.8%  Pred. No. 3.03e-27;
Matches             40;  Conservative 30;  Mismatches 57;  Indels 3;  Gaps 3;

Db      77  LF-SQQEYFLQMPDGTIDTCKDENSYYTLENLIPVCLRVVAIQGVKAGLYVAMNREGYL 135
      | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy      49  LYCSNGGHFLRLLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGYQLAMDTDGLL 108

Db      136  YSSDVFTPECKPFVESVENTYVI-YSTSLY-RQESGRANFELGLNKEGQIMKNRNVKTK 193
      | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy      109  YGSOTPNNECLFLERLEAEATPAPNHYNTYISKKHAENKWFVGLKNGCKSGKGRPHYQG 168

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